City of Chino
Climate Action Plan

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Prepared by Arup North America Ltd

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Executive Summary

This summary provides an overview of the City of Chino's Climate Action Plan (CAP). The plan sets policy and identifies activities for the City, its residents, and business to undertake to reduce the City's contributions to global climate change.

What is a Climate Action Plan?

A CAP serves as a community document that measures and monitors the trend of locally-generated greenhouse gas emissions that contribute to global climate change. The CAP uses this information about emissions to gauge the need for—and optimize the effectiveness of—policies aimed at reducing such emissions. It sets local policy for how emissions will be reduced, which in turn serves to help reduce the community's contribution to global climate change. The Chino CAP incorporates a variety of reduction approaches and strategies including mandatory measures, incentive-based measures, public outreach and education, and coordination with county, regional, and state strategies in order to accomplish emission reductions in an efficient and cost-effective manner.

Why Prepare a Climate Action Plan?

Chino is preparing this Citywide CAP in response to State mandates and regional guidance on reducing greenhouse gas emissions. The plan supports local economic development by providing streamlined environmental review for development projects consistent with the CAP. It implements many of the policies found in other parts of the City's General Plan. The CAP shows the City's commitment to reducing greenhouse gas emissions through its own operations; allows local building owners and managers to save money over time by reducing energy use; and supports the City's healthy community efforts by improving conditions for pedestrians and cyclists.

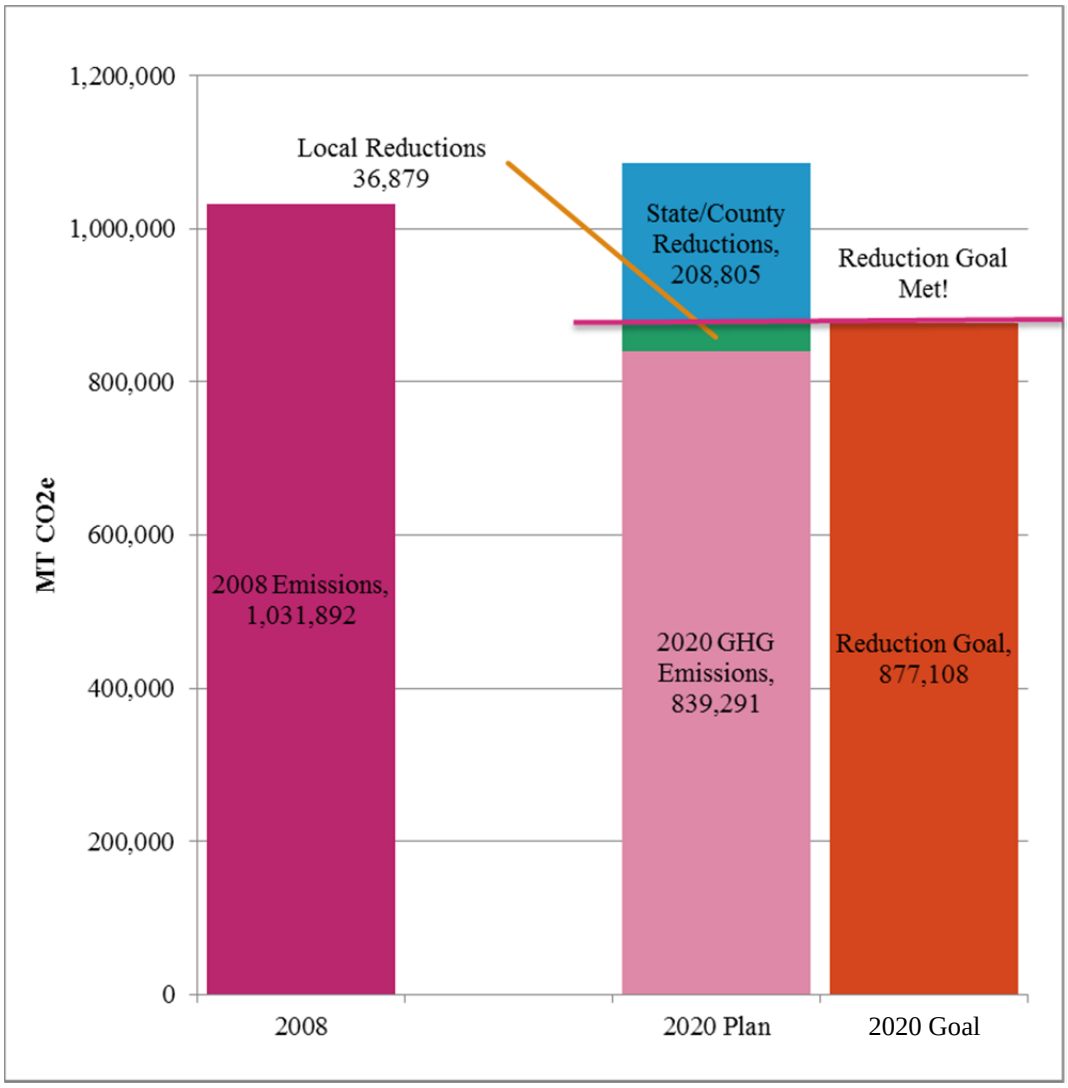
Healthy City, Climate-Friendly City

This CAP identifies the co-benefits of reducing greenhouse gas emissions. Because of Chino's commitment to community health, several of the reduction measures focus on efforts that will support healthy forms of transportation, improve air quality, and reduce summer heat. These include pedestrian and bicycle master plans, green building standards, public transit improvements, and an urban forest plan. Upon implementation, these actions will facilitate walking and biking in the City for people of all ages.

Preparing for Climate Change in Chino

Climate change is a term used to describe large-scale shifts in patterns in earth's climate system. Over the past several decades, these changes have been human-induced due to concentrations of gases in the earth's lower atmosphere. In Chino, climate change is expected to result in increases in overall average temperatures, as well as an increase in the number of high heat days. While the City's actions, in concert with other regional, state, federal, and international actions, will help to moderate these expected impacts, global climate change is already happening. For this reason, the CAP focuses on adaptive greenhouse gas reduction measures that both reduce emissions and help the City prepare for the impacts of climate change.

Figure ES-1: Chino Emissions Forecast Compared to Reduction Goal



Source: SANBAG, 2013.

Chino's Greenhouse Gas Emissions

The City of Chino has evaluated its 'baseline' emissions in 2008, before the State of California and others began many current efforts to reduce climate change-inducing emissions (shown in the magenta bar in Figure ES-1 below). Through this CAP, the City is setting a goal of a 15% reduction in emissions by the year 2020 (orange bar). The figure also shows how the emissions reduction measures in this plan (blue and green) will reduce emissions below the City's goal, indicated with the magenta line. If the CAP were not implemented, emissions in 2020 would be higher than 2008, at the top of the pink, green, and blue bars combined.

Monitoring Chino's Progress

City staff will form a CAP Implementation Team (CIT), which will be responsible for establishing and following a clear timeline for implementing the measures listed in this CAP. The CIT will also evaluate the measures to ensure they are functioning as expected and are cost-effective, and propose alternative measures to fulfill the CAP's goal if changes are necessary. Major amendments will require review by the CIT, Planning Commission and adoption by the City Council. Minor amendments can be accomplished upon review and recommendation by the CIT and approval by the Director of Community Development.

1 Introduction

1.1 What is a Climate Action Plan?

A Climate Action Plan (CAP) serves as a community document that measures and monitors the trend of locally-generated greenhouse gas emissions. The plan uses this information about emissions to gauge the need for—and optimize the effectiveness of—policies aimed at reducing such emissions. It sets local policy for how emissions will be reduced, which in turn serves to help reduce the community's contribution to global climate change. In many cases, emission reduction policies help achieve other local goals.

Due to the technical nature of this climate action plan, it uses a large number of acronyms. These are spelled out in Appendix A.

The City of Chino's CAP is the City's long-range plan to reduce its share of greenhouse gas (GHG) emissions in response to State Mandates and regional guidance on GHG reductions. The CAP is a strategy for Chino to manage its growth in a sustainable way that meets GHG reduction goals while also allowing for development that will keep the City a vibrant and liveable community. The plan supports local economic development by providing streamlined environmental review for development projects consistent with the CAP, and it also benefits from numerous State and regional initiatives that are reducing GHG emissions.

A Climate Action Plan Advisory Committee was appointed by the City Council in 2012 to guide staff in the preparation of the CAP and related General Plan policies. The Committee members are from a diverse array of interest groups within the City, including business, development, agriculture, education, environment, and community interests.

1.2 State Mandates

California has adopted statewide legislation addressing various aspects of climate change and GHG emissions mitigation. Much of this legislation is not directed at citizens or cities specifically, but rather establishes a broad framework for the state's long-term GHG reduction and climate change adaptation program. Several executive orders related to the state's evolving climate change policy have also been enacted. The following state regulations related to climate change and GHGs serve as key underpinnings to this CAP.

Executive Order S-03-05 (2005)

Signed by Governor Arnold Schwarzenegger on June 1, 2005, Executive Order S-3-05 asserts that California is vulnerable to the effects of climate change. To combat this concern, Executive Order S-3-05 established the following GHG emissions reduction targets for state agencies.

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80% below 1990 levels.

Executive orders (EO) are binding only on state agencies. Accordingly, EO S-03-05 will guide state agencies' efforts to control and regulate GHG emissions but will have no direct binding effect on local government or private actions. The secretary of the California Environmental Protection Agency (Cal-EPA) is required to report to the governor and state legislature biannually on the impacts of global warming on California, mitigation and adaptation plans, and progress made toward reducing GHG emissions to meet the targets established in the executive order.

Assembly Bill 1493—Pavley Rules (2002, Amendments 2009)

Known as "Pavley I," AB 1493 standards were the nation's first GHG standards for automobiles. AB 1493 requires the California Air Resources Board (CARB) to adopt vehicle standards that will lower GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as "Pavley II", now referred to as the "Advanced Clean Cars" measure) has been proposed for vehicle model years 2017–2025. Together, the two standards are expected to increase average fuel economy to roughly 43 miles per gallon by 2020 (and more for years beyond 2020) and reduce GHG emissions from the transportation sector in California by approximately 14%.

In June 2009, the Environmental Protection Agency (EPA) granted California's waiver request, enabling the state to enforce its GHG emissions standards for new motor vehicles beginning with the current model year. EPA and CARB have worked together on joint rulemaking to establish GHG emissions standards for model-year 2017–2025 passenger vehicles. As noted above, the federal government completed rulemaking in summer 2012 resulting in adoption of new standards that would lead to fleet average of 54.5 mpg in 2025.

Senate Bills 1078 (2002), Senate Bill 107 (2006) and Senate Bill 2 (2011)—Renewable Portfolio Standard

Senate Bill (SB) 1078 and SB 107, California's Renewable Portfolio Standard (RPS), obligates investor-owned utilities (IOUs – Southern California Edison and Southern California Gas Company), energy service providers (ESPs – suppliers who use the same transmission system as the IOUs), and Community Choice Aggregations (CCAs – a system allowing cities and counties to aggregate the buying power of individual customers to secure alternative energy supply contracts) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. The California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are jointly responsible for implementing the program. Senate Bill 2 (2011) set forth a longer-range target of procuring 33% of retail sales by 2020.

Executive Order S-01-07—Low Carbon Fuel Standard (2007)

Executive Order S-01-07 mandates: (1) that a Statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that an Low Carbon Fuel Standard (LCFS) for transportation fuels be established in California. The executive order initiated a research and regulatory process at CARB. CARB developed the LCFS regulation pursuant to the authority under AB 32 and adopted it in 2009. In late 2011, a federal judge issued a preliminary injunction blocking enforcement of the LCFS, ruling that the LCFS violates the interstate commerce clause (Georgetown Climate Center 2012). The injunction was lifted in April 2012 so that CARB can continue enforcing the LCFS pending CARB's appeal of the federal district court ruling.

1.3 Relationship to General Plan

The CAP serves as the City's primary information and policy document for GHG emissions reductions. The Chino General Plan Update**,** which was adopted in July 2010, provides the supporting policy framework for land use and development in the City through the year 2025. It also contains goals and policies referencing the need for a CAP to address the issue of GHG emission reduction more comprehensively. Although both the General Plan and the CAP are long-range plans, the CAP was not included as part of the General Plan itself in order to provide more flexibility in updating it on a more regular basis to add and amend emissions reduction measures as new information, policy guidance, and regulations regarding GHG emissions evolve, and new information and technologies to address GHG emissions are developed. Since the General Plan Update was approved in 2010, additional policies were added to the General Plan in December 2012 in support of the City's GHG reduction measures. The full list of GHG-supporting General Plan policies is found in Appendix B.

1.4 Community Benefits from Greenhouse Gas Reductions

Any GHG reduction effort should recognize that most people do not adopt greenhouse gas-reducing behaviors primarily for the sake of the environment. Cost savings, health benefits, social approval, and reducing risks are the most common reasons for choices that happen to be more sustainable.

The CAP reduction measures and strategies will help reduce GHG emissions and better prepare the City of Chino for possible climate changes in the future. This CAP includes adaptation measures in Chapter 12 that will help the community respond wisely to changes in the climate that impact daily life.

Some specific examples of the additional benefits of GHG reduction, called co-benefits, are shown in Table 1.

Table 1: Co-Benefits from GHG Reduction

Co-Benefit	How it works
Healthier Travel	Bicycle and pedestrian transportation system improvements provide options to increase physical activity.[1]
Local Economic Benefits	Increased pedestrian and bicycle activity in downtown commercial areas have been linked to more successful downtown commercial areas.[2]
Healthier Air (e.g., reduced onset of asthma in children[3]).	Reduced pollution from motor vehicles from cleaner vehicles and reduced motor vehicle travel.
Safer Streets	Reduced motor vehicle speeds due to traffic calming.[5 4] Pedestrian and bicycle-friendly streets.[65]
Energy Savings	Reduced energy use in buildings and other facilities. Transit service improvements.
Water Cost Savings	Reduced water use in buildings and other facilities.
Waste Disposal Savings	Reduced volumes of waste sent to landfill, lower operations and construction costs for new and existing landfills.

[1] Sallis et al, 2009.
[2] Bent and Singa, 2009. For discussions of how pedestrian activity increases with shorter blocks and other design features, see Marshall and Garrick 2010, as well as Ewing and Cervero 2010
[3] Health Effects Institute 2010 notes that motor vehicles are a significant source of urban air pollution, and are especially health-impacting to people living and working within close proximity of busy highways and roads despite more stringent emissions controls currently in place. Links from traffic-related exposure to childhood on-set pulmonary disease are approaching sufficiently causal (rather than just "suggestive"), while causal links to other chronic diseases and overall mortality are suggestive though not yet sufficiently proven in the literature.
[4] Litman 1999 summarizes numerous studies linking lower vehicle speed to reduced crashes and injuries, and links traffic calming interventions to lower vehicle speeds.
[5] Community Preventative Services Task Force 2004. A task force appointed by the US Centers for Disease Control reviewed research and found that policy instruments (like building codes, roadway design standards, and other environmental changes) as well as design approaches (like improved street lighting, infrastructure projects to increase safety of street crossing, use of traffic calming approaches, and enhancing street landscaping) resulted in a 35% median improvement in some aspect of physical activity (e.g., number of walkers or % of active individuals).

1.5 Regional Partnership to Address Greenhouse Gas Emission Reduction

Since 2006, there have been a number of state initiatives put in place to address the issue of climate change. These include the Global Warming Solutions Act of 2006, also known as Assembly Bill 32(AB 32) and the Sustainable Communities and Climate Protection Act of 2008, also known as Senate Bill 375 (SB 375) calling for GHG emissions reductions in California. In response to these initiatives, an informal project partnership, led by the San Bernardino Associated Governments (SANBAG), has been formed to cooperate in the preparation of the San Bernardino County Regional Greenhouse Gas Reduction Plan ("the Plan") authored by ICF International, San Francisco, CA, September 2012. The Plan provides a comprehensive inventory of GHG emissions and an evaluation of reduction measures that could be adopted by the 21 Partnership Cities of San Bernardino County (Partnership). The Partnership has committed to undertake the following actions that will reduce GHG emissions associated with its regional (or countywide) activities as a whole:

1. Preparation of a current year (2008) GHG emissions inventory for each of the 21 Partnership cities in the county;
2. Preparation of a future year (2020) GHG emissions forecast for each of the cities;
3. Development of a tool for each city to inventory municipal operations (i.e., emissions due only to the City's municipal operations and sometimes referred to as municipal inventory) and prepare a municipal reduction plan;
4. Development of GHG reduction measures and City selection of measures appropriate for each jurisdiction; and
5. Development of consistent baseline information for jurisdictions to use for their development of community climate action plans meeting jurisdiction-identified reduction goals.

By working in a collaborative manner on these goals, the cities aim to more effectively address emissions from activities that are affected or influenced by the region as a whole. The 21 Partnership cities participating in this study are Adelanto, Big Bear Lake, Chino, Chino Hills, Colton, Fontana, Grand Terrace, Hesperia, Highland, Loma Linda, Montclair, Needles, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Twentynine Palms, Victorville, Yucaipa, and Yucca Valley.

The Chino CAP, prepared by the City of Chino, incorporates the inventory, forecast, and GHG reduction measures prepared for the SANBAG Plan, and builds upon them to create a comprehensive local CAP for Chino.

1.6 Relationship to California Environmental Quality Act (CEQA)

This CAP will help the City of Chino foster economic development by providing a straight-forward approach to addressing climate change during the environmental review process required by the State. That approach is described in the amended provisions of Section 15183.5 of the CEQA Guidelines which became effective in March 2010. It allows for tiering of project-level analysis of GHG emissions from a programmatic document, such as this CAP, and also allows for a finding of less than significant impact where a project is determined to be consistent with a CAP. This CAP, along with its environmental impact report (EIR) will allow Chino to tier project-level analysis of GHG emissions, thus streamlining the environmental review process, and making it easier to develop new businesses and construct new buildings in Chino.

2 Climate Change and Chino

Climate change is a term used to describe large-scale shifts in existing (i.e., historically observed) patterns in earth's climate system. Although the climate has historically responded to natural factors, recent climate change has been unequivocally linked to human-generated increases in concentrations of GHGs in earth's lower atmosphere and the rapid timescale on which these gases have accumulated[6].

2.1 Types of Greenhouse Gases

The rapid increase of GHGs into the atmosphere is primarily due to the burning of fossil fuels since the industrial revolution. GHGs play a critical role in maintaining the earth's temperature for successful habitation by humans and other forms of life, but the increased concentrations of heat-trapping GHGs in the atmosphere result in higher global surface temperatures. The principle greenhouse gases include:

1) Carbon Dioxide (CO_2)

CO_2 is the most important anthropogenic GHG and accounts for more than 75% of all GHG emissions. The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO_2 can be removed from the atmosphere by photosynthetic organisms (e.g., plants and certain bacteria).

2) Methane (CH_4)

CH_4, the main component of natural gas, is the second most abundant GHG. Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal (National Oceanic and Atmospheric Administration 2005). Certain land uses also function as both a source and sink for CH4. For example, the primary terrestrial source of CH_4 are wetlands, whereas undisturbed, aerobic soils act as a CH4 sink (i.e., they remove CH_4 from the atmosphere).

3) Nitrous Oxide (N_2O)

N_2O is a powerful GHG, with sources of N_2O including agricultural processes (e.g., fertilizer application), nylon production, combustion of fossil fuel by power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. In the United States more than 70% of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application.

[6] Intergovernmental Panel on Climate Change 2007a

4) Perfluorinated Carbons (PFC)

The most abundant PFCs are CF_4 (PFC-14) and C_2F_6 (PFC-116). These human-made chemicals are emitted largely from aluminum production and semiconductor manufacturing processes. PFCs are extremely stable compounds that are destroyed only by very high-energy ultraviolet rays, which results in very long lifetimes.

5) Sulfur Hexafluoride (SF_6)

SF_6 is a human-made chemical used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, semiconductor manufacturing, and also as a tracer chemical for the study of oceanic and atmospheric processes (U.S. Environmental Protection Agency 2006). SF_6 is the most powerful of all GHGs listed in Intergovernmental Panel on Climate Change studies.

6) Hydrofluorocarbons (HFC)

HFCs are human-made chemicals used in commercial, industrial, and consumer products. HFCs are generally used as substitutes for ozone-depleting substances (ODS) in automobile air conditioners and refrigerants.

2.2 Measurement of Greenhouse Gases

The gases described in Section 2.1 each have a different potential to increase global warming, meaning that emitting the same amounts of CO_2 and CH_4 will have different impacts to global warming. The factors measuring the differences in impact between gases are called the Global Warming Potential (GWP) factors. The GWP factors are used in this plan to compare emissions of GHGs according to the Carbon Dioxide Equivalent (CO2e) of their impact to global warming. This facilitates comparison of total emissions across sectors, across years, and across municipalities regardless of the composition of the emissions profile (i.e. which gases are emitted).

In this CAP, amounts of GHGs are reported in metric tons of carbon dioxide equivalent, abbreviated $MTCO_2e$, and generally measured over the timespan of one year.

2.3 Projected Climate Change Impacts in Southern California

Increases in the globally-averaged atmospheric concentration of GHGs would cause the lower atmosphere to warm, in turn inducing significant changes to the global climate system. These large scale changes are expected to cause unique and potentially severe impacts in the western United States, California, and the Inland Empire. Current research efforts coordinated through CARB, CEC, Cal-EPA, University of California (UC) system, and others are examining the specific changes to California's climate that would occur as the earth's surface warms.

Existing evidence indicates that climate change could impact the natural environment in the following ways, among others.

- Rising sea levels along the coastline.
- Extreme-heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent.
- An increase in the frequency, intensity, and duration of conditions that is conducive to forming air pollution, further exacerbating air quality issues.
- An increase in heat-related human deaths, infectious diseases, and a higher risk of respiratory problems caused by deteriorating air quality.
- Potential increase in the severity of winter storms, affecting peak stream flows and flooding.
- Changes in growing season conditions that could affect agriculture, causing variations in crop quality and yield.
- Changes in distribution of plant and wildlife species due to changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate related effects.
- Decreased Sierra snowpack and altered timing and amount of snowmelt; effects on California water supplies and water management including those serving southern California.
- Increased frequency and intensity of wildfires.

2.4 Projected Climate Change Impacts in Chino

As an inland City, Chino will likely not experience all of the project climate change impacts expected for Southern California, such as rising sea levels, increased threat of wildfires or reduced snowpack levels.[7] What Chino can likely expect to occur due to climate change is an increase in the overall annual average temperature, the number of extreme heat days per year, and the number of heat waves per year. These specific forecasts include:

- Increasing annual average temperatures rising from a historical average of 64.6F to approximately 68F in 2020 and approximately 71F in 2050[8].
- The number of heat days (temperatures measuring 100 F and above) rising from a historical average of four per year to eleven in 2020 and 45 in 2050[9].

[7] Data from Cal-Adapt. http://cal-adapt.org/tools/
[8] Data from Cal-Adapt. http://cal-adapt.org/tools/
[9] Data from Cal-Adapt. http://cal-adapt.org/tools/

3 Greenhouse Gas Emissions: Existing and Business as Usual Forecast

3.1 2008 Baseline Emissions Inventory

The baseline emissions that are used in the Chino CAP use as a point of comparison for its progress in reducing GHG emissions over the years to come were prepared as part of the SANBAG Plan. The 2008 GHG inventory is based mostly on actual 2008 activity data (estimates were used for activity data in a few sectors, including housing and employment) and year 2008 emission factors and includes all significant contributing sectors to GHG emissions, according to the guidelines of the ICLEI U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI–Local Governments for Sustainability USA 2012) and the CARB Local Governments Operations Protocol (LGOP) (2010). The City considered the use of 1990 as a baseline year for the inventory; however the data is very limited and not consistent with current methods of estimating emissions; therefore, 1990 data was not used. This inventory was developed to support the identification of GHG-reduction measures specific to the City's emissions.

Chino's 2008 inventory includes GHG emissions occurring within the boundaries of the City. The emissions sectors listed in Table 2 are included in the community inventories. The data sources and methods for the inventory are compiled in Appendix C, which is an excerpt from the SANBAG Plan.

Table 2: Emissions Sectors

Sector
Building Energy • Residential: natural gas (direct emissions) and electricity consumption (indirect emissions) for the residential sector. • Commercial / Industrial: natural gas (direct emissions) and electricity consumption (indirect emissions) for the commercial and industrial sectors. • Residential Electricity • Commercial/Industrial Electricity • Cement plants, fuel combustion, industrial process emissions etc.
On-Road Transportation • Light/Medium-Duty Vehicles: fuel consumption for light-duty and medium-duty passenger vehicles traveling in Chino. • Heavy-Duty Vehicles: fuel consumption for heavy-duty trucks traveling in Chino.
Off-Road Equipment • Fuel consumption for off-road vehicles and equipment in Chino. Data provided by the OFFROAD model.
Solid Waste Management • CH_4 emissions from waste generated by each city and deposited in landfills. Data provided by CalRecycle.

Table 2: Emissions Sectors (continued)

Sector
Wastewater Treatment • Fugitive emissions from domestic wastewater treatment.
Agriculture • Enteric fermentation, manure management, and fertilizer application from dairy operations.
Water Conveyance • Electricity consumption associated with water importation.

3.2 2020 Business as Usual Forecast Emissions

A Business As Usual (BAU) projection was developed for the year 2020 (2020 BAU forecast) as part of the SANBAG Plan. This projection forecasts future emissions based on current energy and carbon in the existing economy. It does not account for any federal, state, or local programs that would reduce emissions and are implemented after the inventory base year (2008), but does reflect the impacts of forecast city growth in population, employment, and housing. The projection does, however, account for the impact of any measures or programs which were implemented prior to 2008, as these programs have already lowered the baseline year emissions. Any measures or programs implemented prior to 2008 are accounted for in the 2008 inventory.

4 Greenhouse Gas Emissions Reduction Targets

4.1 Regulatory Guidance for Target Development

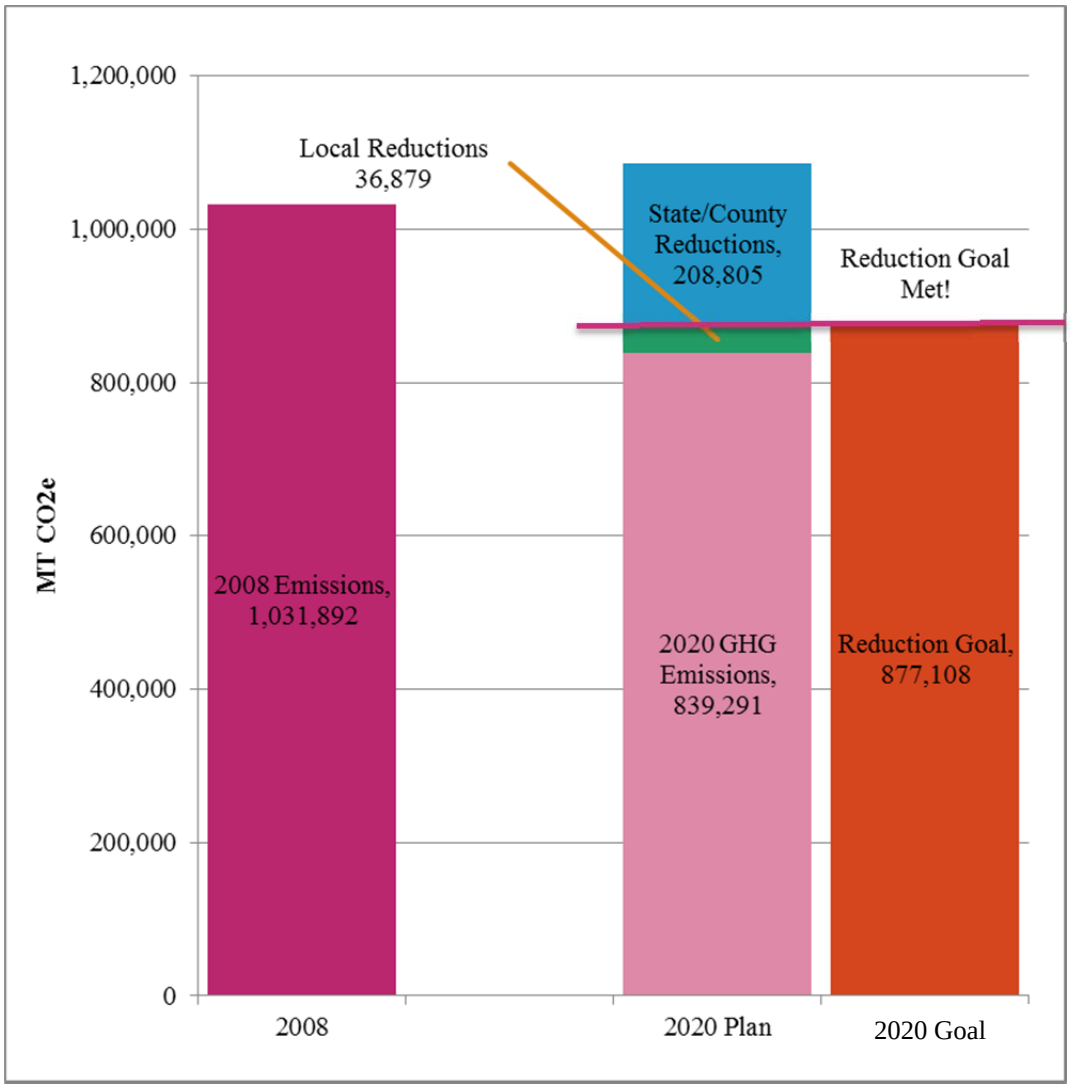
As part of the AB 32 Scoping Plan, 2008, the Air Resources Board (ARB) recommended a greenhouse gas reduction goal for local governments of 15% below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target. SCAQMD's guidance on this issue encourages local governments to adopt a qualified GHG reduction strategy consistent with the AB 32 Scoping Plan and the amended CEQA guidelines. Following this guidance, the City of Chino selected a goal to reduce its community GHG emissions to a level that is 15% below its 2008 emissions level by 2020. This amounts to a reduction of nearly 209,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) in annual emissions by 2020 compared to the BAU forecast.

4.2 Forecast Compared to Goal

In order to achieve its reduction goals, the City is proposing a set of reduction measures that is a combination of state (~85%) and local (~15%) efforts, as shown in Figure 1. The City actually exceeds the goal with only state/county level actions (100% of goal), but has committed to several additional local measures designed to show the City's commitment to reducing greenhouse gas emissions through its own operations; to save money over time for local building owners and managers by reducing energy use; and to support the City's healthy community efforts by improving conditions for pedestrians and cyclists. The Pavley vehicle standards, low carbon fuel standard, Renewable Portfolio Standard, and other state measures (described in Appendix D) will provide nearly 209,000 $MTCO_2e$ in GHG emissions reductions for Chino's on-road and building energy sectors in 2020. An additional reduction of nearly 37,000 $MTCO_2e$ will be achieved primarily through local measures as described in Chapters 6 through 11 of this CAP. Implementation of these local measures will actually achieve a reduction of nearly 246,000 $MTCO_2e$, which is 18% over the City's selected goal.

Chino's reduction measures have the greatest impacts on GHG emissions in the on-road transportation, building energy, and solid waste management sectors, as shown in Figure 2.

Figure 1: Chino Emissions Forecast Compared to Reduction Goal



Source: SANBAG, 2013.

Figure 2: Emissions by Sector for Chino

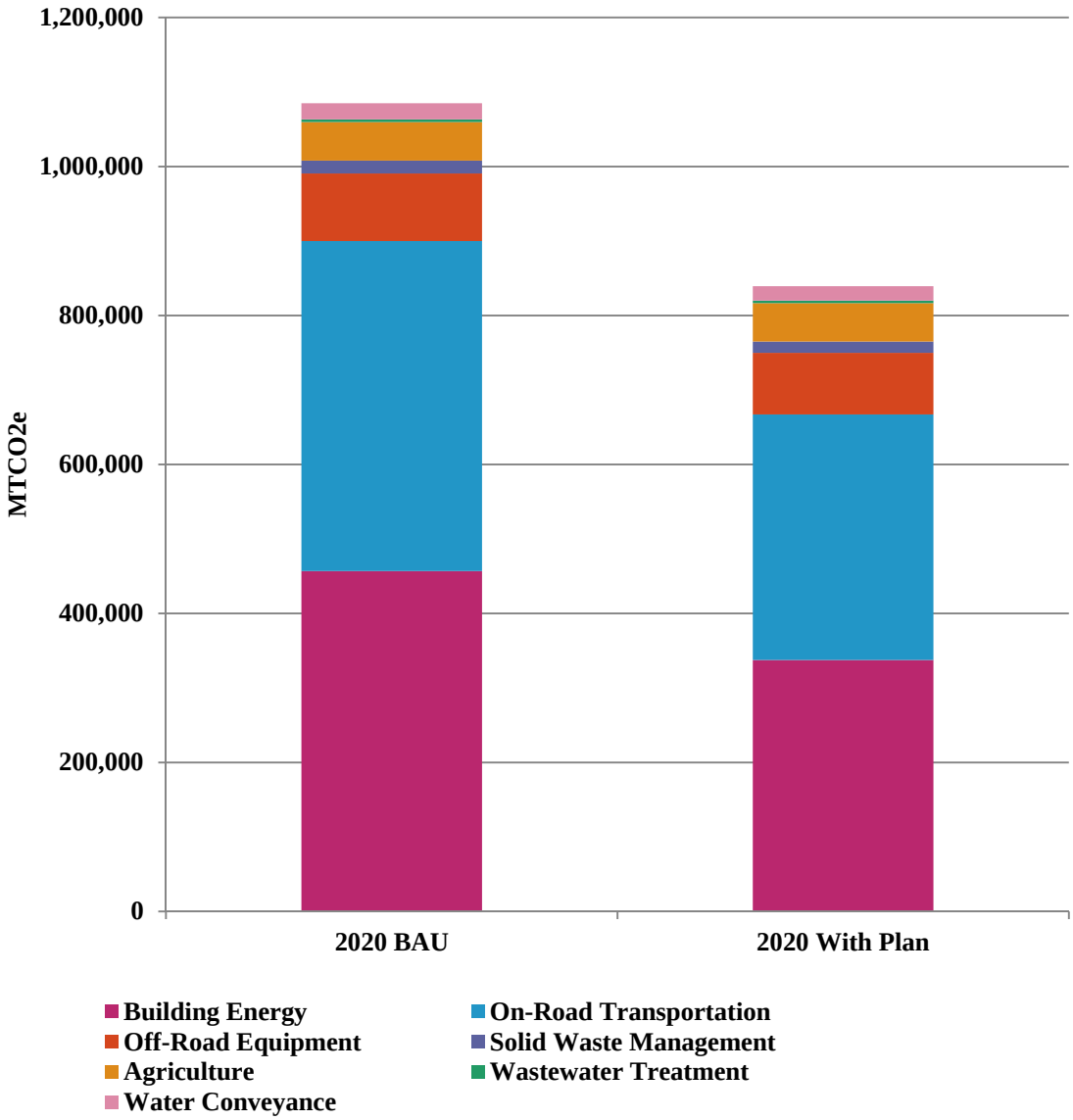


Table 3: Greenhouse Gas Emissions Reductions

Sector	2008	2020 BAU	Reductions	2020 Emissions with Reduction Plan	% Reduction
Building Energy	403,585	456,978	-119,138	337,840	26.1%
On-Road Transportation	407,132	443,060	-113,419	329,640	25.6%
Off-Road Equipment	82,908	90,661	-8,100	82,562	8.9%
Solid Waste Management	16,239	17,305	-2,077	15,227	12.0%
Agriculture	101,287	51,623	0	51,623	0.0%
Wastewater Treatment	3,057	3,613	-232	3,381	6.4%
Water Conveyance	17,684	21,736	-2,432	19,305	11.2%
Energy Efficiency for New Development[3]	-	-	-286	-	-
Total	1,031,892	1,084,975	-245,684	839,291	22.6%
Reduction Goal	-	-	*207,867*	*877,108*	*15% below 2008 baseline*
Does the Plan meet the Goal?	-	-	*Yes*	*Yes*	*Yes*
Reductions Beyond Goal	-	-	*37,817*	-	*7.6%*
Per-Capita Emissions	13.7	12.2	-	9.5	-
Per-Job Emissions	21.3	20.3	-	15.7	-

Notes:

[1] Excluded Stationary Sources emissions for 2008 (*207,650)* for 2020 BAU (*244,412).*

[2] Values may not sum due to rounding.

[3] Energy Efficiency for New Development also known as GHG Performance Standard for New Development is not a sector of the inventory, but it contributes toward the City's reduction goal by promoting reductions in multiple sectors. Please see Section 6.3 for a complete description of this measure.

5 Greenhouse Gas Reduction Strategies and Measures

5.1 Regional Transportation Planning Context

Transportation-related greenhouse gas emissions reductions are a very important component of regional and local efforts to meet reduction goals. Chino benefits from a robust effort on the part of the Southern California Association of Governments (SCAG) to prepare the 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future. The RTP/SCS is the culmination of a multi-year effort involving stakeholders from across the Southern California Association of Governments (SCAG) Region. SCAG has prepared RTPs for the southern California region for over 30 years, with the primary goal of increasing mobility for the region's residents and visitors. The 2012–2035 RTP/SCS includes the following key features:

- A strong commitment to reduce emissions from transportation sources to comply with SB 375, improve public health, and meet the National Ambient Air Quality Standards as set forth by the federal Clean Air Act. As such, the 2012–2035 RTP/SCS contains a regional commitment for the broad deployment of zero- and near-zero criteria pollutant emission transportation technologies in the 2023–2035 time frame and clear steps to move toward this objective. This strategy will have many co-benefits, including energy security, cost certainty, increased public support for infrastructure, GHG reduction, and economic development.
- A transportation infrastructure investment strategy that will benefit Southern California, the state, and the nation in terms of economic development, competitive advantage, and overall competitiveness in the global economy in terms of attracting and retaining employers in the Southern California region.
- A blueprint for improving quality of life for southern California residents by providing more choices for where they will live, work, and play, and how they will move around. It emphasizes transit and active transportation to allow residents to lead healthier, more active lifestyles.

It is important to note that the land use pattern adopted in the SCS is not a mandatory land use pattern and no local government is obligated to amend their general plans to be consistent with the assumed land use pattern in the SCS if there are differences between a city's General Plan and the land use pattern assumed in the SCS. SCAG has no authority under SB 375 to mandate local land use planning, which is reserved for the authority of local cities and counties.

All of the key features of the RTP/SCS support Chino's efforts to reduce greenhouse gas emissions at the local level, providing the regional roadway, transit, bicycle, and pedestrian framework with which the City's local network interacts. These efforts are documented in the City's General Plan policies, and

described in Appendix B. The regional per capita GHG emission reductions resulting from the use of these multi-modal networks will be 9% below 2005 emission levels in 2020.[10]

5.2 State, County and Local Reduction Measures

The City of Chino will meet and exceed its GHG emissions reduction goal through a combination of state, county, and local measures.

State Reduction Measures

Actions undertaken by the State will contribute to GHG reductions in Chino. For example, the State requires electric utility companies to increase their procurement of renewable resources by 2020. Renewable resources, such as wind and solar power, can eventually produce the same amount of energy as coal and other traditional sources currently provide, but do not emit any GHGs. By generating a greater amount of energy through renewable resources, electricity provided for use by Chino residents will be cleaner and less GHG intensive than if the State did not require the renewable standard. Even though state measures do not always require local government action, emissions reductions achieved by this and other state measures will help lower GHG emissions in Chino.

This CAP includes nine statewide initiatives that would contribute to GHG reductions in Chino. A complete list of state programs included in the CAP is presented in Appendix D.

The majority of these programs will improve building energy efficiency and renewable energy generation. Specifically, Title 24 energy efficiency standards for new residential and non-residential buildings will require building shells and components be designed to conserve energy and water. These requirements have been recently updated, and made more rigorous, and will be in effect as of January 1, 2014. Similarly, energy efficiency strategies required by AB 1109 will reduce electricity consumption from inefficient lighting sources in the City.

Over the past several decades, California has become a leader in establishing initiatives to reduce fuel consumption and on-road vehicle emissions. This continues in combination with federal efforts on the Corporate Average Fuel Economy (CAFÉ) standards, which are federal regulations intended to improve the average fuel economy of cars and light trucks sold in the U.S.CARB has also adopted the LCFS, which requires a 10% reduction in the carbon intensity of California's transportation fuels by 2020 and several efficiency measures are outlined in the AB 32 Scoping Plan. Together, these measures will reduce light- and heavy-duty vehicle emissions.

[10] www.scagrtp.net

County Reduction Measure

San Bernardino County plans to install methane capture systems at a number of county-owned and operated landfills. Since these landfills serve Chino, the City will benefit from emission reductions from their solid waste management sector, as fewer methane emissions from the decomposition of city-generated waste will be released into the atmosphere.

Local Reduction Measures

The local reduction measures included in this CAP are in the following areas – Building Energy, On-Road Transportation, Solid Waste Management, Wastewater Management, Water Conveyance, and Municipal Measures. These measures are described in Chapters 6 through 11 of this CAP.

5.3 Summary of Reduction Measures

The Chino CAP is built on a combination of State, County, and local reduction measures to achieve, and exceed, Chino's GHG reduction goal of 15% below 2008 levels. Implementation of the measures quantified in the SANBAG Plan will allow Chino to exceed the reduction goal. Several additional measures that are not quantified will also reduce GHGs; together, they represent a comprehensive plan for GHG reduction in Chino. Table 4 below summarizes the measures included in the CAP, and a more detailed description of the local measures follows in Chapters 6 through 11.

Table 4: Summary of Reduction Measures

Measure	Measure Description	Reductions (MT CO_2e/year)
State/County Measures		
State-1	Renewable Portfolio Standard	54,378
State-2	Title 24 (Energy Efficiency Standards)	13,112
State-3	AB 1109	14,256
State 4	Solar Water Heating	204
State-5	Industrial Boiler Efficiency	3,878
State-6	Pavley plus Low-Carbon Fuel Standard: On-Road	103,180
State-7	AB 32 Transportation Reduction Strategies	9,804
State-8	Low-Carbon Fuel Standard: Off-Road	8,100
State-9	AB 32 Methane Capture	1
County-1	San Bernardino County GHG Plan Landfill Controls	1,893

Table 4: Summary of Reduction Measures (continued)

Measure	Measure Description	Reductions (MT CO_2e/year)
Local Measures		
Building Energy		
Local E-1	Energy Efficiency for Existing Buildings	2,019
Local E-2	Energy Efficiency for New Development	286[1]
Local E-3	Voluntary Time-of-Sale Residential Energy Efficiency	N/A[2]
Local E-4	Solar Installation for New Housing	359
Local E-5	Solar Installation for New Commercial / Industrial	1,104
Local E-6	Solar Installation for Existing Housing	2,629
Local E-7	Solar Installation for Existing Commercial / Industrial	1,569
Local E-8	Energy Efficiency Equipment Upgrades at WWTP	1,249
Local E-9	Outdoor Lighting Upgrades for Existing Development	N/A[2]
Local E-10	Construction Energy Use	N/A[2]
Local E-11	Adopt Relevant Voluntary Measures from the California Green Building Standards Code	N/A[2]
Local E-12	Implement SB X7-7: Energy Savings from Reduced Water Use	24,381
Local E-13	Voluntary Green Business Certification Program	N/A[2]
On-Road Transportation		
Local T-1	Smart Bus Technologies	436
Local T-2	Bicycle Master Plan	N/A[2]
Local T-3	Pedestrian Master Plan	N/A[2]
Local T-4	Transportation Demand Management	N/A[2]
Local T-5	Urban Forest Plan	N/A[2]
Solid Waste Management		
Local WA-1	Waste Diversion Program	183
Wastewater Treatment		
Local WW-1	Recycled Water	N/A[2]
Local WW-2	Implement SB X7-7: Energy Savings from Wastewater Treatment	232
Water Conveyance		
Local W-1	Water-Efficient Landscaping Practices	754
Local W-2	Implement SB X7-7: Energy Savings from Water Conveyance	1,678
Total Reductions		245,685

[1] GHG performance standard.

[2] Quantification unavailable for measures which were not included in the SANBAG Plan.

6 Local Building Energy Measures

6.1 Adopted Green Building Standards

Reducing energy consumption in new and existing buildings is a central part of the City's carbon emission reduction strategy. In 2012, in advance of preparing this CAP, the City reviewed the voluntary measures from the Green Building Standards Code and adopted the following items, making them mandatory in Chino:

- Electric Vehicle Charging: Dwellings shall comply with the following requirements for future installation of electric vehicle supply equipment (EVSE).
- Appliance and Equipment Energy Star Rating: Each appliance provided by the builder meets ENERGY STAR if an ENERGY STAR designation is applicable for that appliance.
- Space for Future Solar Installation: A minimum of 300 square feet of unobstructed roof area facing within 30 degrees of south is provided for future solar collector or photovoltaic panels.
- Low-water Consumption Irrigation System: Install a low-water consumption irrigation system which minimizes the use of spray type heads.
- Water Budget: When landscaping is provided by the builder, a water budget shall be developed for landscape irrigation use that conforms to the requirements of Chapter 20.19 of the Chino Municipal Code.
- Enhanced Construction Waste Reduction: Divert to recycle or salvage at least 65% of non-hazardous construction and demolition debris generated at the site.

6.2 Local E-1: Energy Efficiency for Existing Buildings

The program targeting building energy efficiency in existing buildings is divided into two key subprograms. The first subprogram will be purely voluntary, increasing utilization of energy efficiency incentives provided by Southern California Edison. The second subprogram will be mandatory for building additions and alterations, requiring that such applicants for additions and alterations permits dedicate funding toward energy upgrades. These paired programs for improving building energy efficiency are described further below.

Energy Efficiency for Existing Buildings – Outreach and Incentives

GOAL: Improve the efficiency of existing buildings by focusing on increasing community awareness and education about energy efficiency; and promoting emissions reduction and existing incentive programs.

Measure Local E-1: Energy Efficiency for Existing Buildings* – Outreach and Incentives	
Metric Tons CO2e Reduced from Baseline	218 from 5% of Residential Buildings Retrofit by 2020 1,806 from 5% of Nonresidential Buildings Retrofit by 2020
Implementation Actions	1. Review the energy efficiency programs for existing buildings offered by utility companies serving Chino. 2. Create outreach materials highlighting the efficiency programs that are most relevant to Chino residents and businesses. 3. Track the energy efficiency programs to understand how they change and identify new programs relevant to Chino.
Responsible Department	Community Development, in coordination with the utility companies.
Monitoring	Track the number and type of retrofits of existing buildings, divided among residential and non-residential structures. Use this information to understand which programs are most relevant to Chino residents and businesses.
Co-Benefits	Reduced energy use, reduced air pollution, increased property values, public health improvements, and increased quality of life.

* This subprogram was quantified by the SANBAG Plan.

The State of California, Southern California Edison (SCE), and Southern California Gas Company (SCG) have a number of incentive programs that are designed, tested, and continuously improved to achieve energy savings in existing buildings. The City of Chino will promote these successful programs by distributing educational materials and information on energy efficiency programs offered by the state, utility companies, and other entities to homeowners and non-residential owners. The information should include available incentive programs, technical assistance, and financial resources such as free energy audits and energy efficiency rebates. The programs fall into several categories, which are described below, along with examples from current offerings by relevant agencies. The programs identified may evolve or be replaced over time with new programs, so Chino staff will maintain current information from the state and utilities on what programs are available.

Category	Current Program Examples
Home retrofits/conservation (single-family)	Home Energy Upgrade Financing program (SCE) Energy Upgrade California (SCE) High Efficiency Hot Water Distribution Program (Solar) (SGC) HERO Financing Program (SANBAG)
Home retrofits/conservation (multi-family)	Energy Efficiency Benchmarking (SGC) Multifamily Direct Installation Programs (SGC) HERO Financing Program (SANBAG)
Home retrofits/conservation (mobile home)	Comprehensive Mobile Home Program (SGC) HERO Financing Program (SANBAG)
Commercial/Industrial (building retrofits/conservation)	Energy Challenger (SCE) Energy Efficient Express Solutions (SCE) Energy Efficiency Customized Solutions (SGC) Small Industrial Facility Upgrades (SGC) Solar Rooftop Program (SCE) Commercial Conservation Rebates (IEUA) HERO Financing Program (SANBAG)

SCE = Southern California Edison
IEUA = Inland Empire Utilities Agency
SGC = Southern California Gas Company
SANBAG = San Bernardino Associated Governments

As noted in the examples above, the HERO PACE (Property Assessed Clean Energy) program applies to all categories because homeowners and businesses can finance home energy and water efficiency upgrades, including installing solar panels, efficient windows and doors, and efficient heating and cooling systems through low-interest loans to be repaid through the property owner's tax bill. The City will coordinate with SANBAG in the implementation of this program and provide information to property owners to increase community awareness of the program.

Energy Efficiency for Existing Buildings – Required Upgrades with Remodels

GOAL: Achieve energy upgrades concurrent with remodels of residential, commercial, and industrial buildings.

Measure Local E-1: Energy Efficiency for Existing Buildings* – Required Upgrades with Remodels	
Metric Tons CO2e Reduced from Baseline	NA*
Implementation Actions	1. Ordinance language implementing the measure will be adopted simultaneous with this CAP. 2. Create handouts describing the new ordinance for addition and alteration applicants.
Responsible Department	Community Development
Monitoring	1. Draft handouts describing the ordinance by 2014 2. Track the dollar amount spent on energy retrofits, by project and project type
Co-Benefits	Reduced energy use, reduced air pollution, increased property values, public health improvements, and increased quality of life.

* This subprogram was not quantified because it was not included in the SANBAG Plan.

The City will require energy efficiency upgrades when projects are submitted for additions or alterations. For residential buildings, the requirement will be triggered only for those remodels considered 'substantial' and defined as above $65,000 in value. For commercial and industrial buildings, all additions and alterations will trigger the requirement.

In all cases of additions and alterations that trigger the requirement, compliance will be structured as follows:

1. Applicants will dedicate an additional amount of 10% of project valuation to energy upgrades, up to a maximum of $20,000 beyond the original permit valuation for the addition or alteration.
2. Applicants will receive credit for the following: 1) Upgrades that are part of the original addition or alteration that exceed local and state requirements, and 2) Additional upgrades that are beyond the original scope of the project that meet local and state requirements.
3. The Building Official will have the flexibility to determine substantial compliance with this Section in cases where practical difficulties make it infeasible to meet the requirements. A project proponent would need to demonstrate in writing that the requirements are financially infeasible, that they are infeasible within the project timeframe that the products needed are not available, or that other practical difficulties exist.

Utility companies spend millions of dollars a year on efficiency upgrades that have been analyzed by the state and found to be cost-effective, so there are many options that property owners can choose that will be cost-effective, and very few buildings for which several different cost-effective options could not be found.

In addition to the energy efficiency upgrades for existing buildings described here, the City will be exploring additional options for requiring greenhouse gas-reducing retrofits on existing sources of greenhouse gas emissions as potential mitigation measures when discretionary actions subject to the California Environmental Quality Act are reviewed by the City.

6.3 Local E-2: GHG Performance Standard for New Development

GOAL: Provide a streamlined and flexible program for new residential, commercial, and industrial development project proponents to implement strategies that will contribute toward the reduction of GHG emissions in the City.

Measure Local E-2: GHG Performance Standard for New Development *	
Metric Tons CO2e Reduced from Baseline	286
Implementation Actions	1. Establish a program for new development projects subject to discretionary review to demonstrate consistency with the CAP by implementing one of the following three options: a) Exceed the mandatory California Energy Code Title 24, Part 6 standards in effect at the time of application submittal by 3%; or b) Achieve an equivalent reduction through voluntary measures in the California Green Building Standards Code, Title 24, Part 11 (CALGreen) in effect at the time of application submittal; or c) Provide other equivalent GHG reductions through measures including but not limited to, non-vehicle transportation infrastructure, transit, ZEV (zero emission vehicle) infrastructure or other incentives, waste diversion, water conservation, tree planting, renewable energy option packages, or any combination of these or other measure such that GHG emissions are reduced by 0.04 MT CO_2e per residential dwelling unit per year and/or 0.11 MT CO_2e per TSF of commercial/industrial use per year. 2. Establish a process to implement this program through conditions of approval in the development entitlement process and construction plan check process including a GHG Performance Standard Checklist that provides specific project features or mitigation that will fulfill the requirements listed in No. 1 above. 3. Create handouts to describe the program and make them available to the development community.
Responsible Department	Community Development
Monitoring	Track projects by size, type of energy savings, and projected energy reductions.
Co-Benefits	Reduced energy use, reduced air pollution, increased property values, public health improvements, and increased quality of life.

* From SANBAG Plan

The City will allow new development projects that require discretionary review to demonstrate compliance with the CAP through one of the options listed in 1a through 1c above. Project applicants will be able to choose the measures that are most feasible, effective, and cost efficient for their specific project. Examples of CALGreen equivalent reductions might include waste diversion or increased water efficiency, and examples of other possible measures are noted above. Applicants that choose Option 1a described above will be required to verify that their project meets the 3% improvement above the mandatory standards through the appropriate certificate of compliance form for residential construction (CF-1R) or for commercial/industrial construction (PERF-1C). Applicants that choose Option 1b or 1c described above will be required to utilize the GHG Performance Standard Checklist developed by the City, or provide other valid documentation, such as CalEEMod or other methodologies, as verified by the Director of Community Development to demonstrate the required GHG reductions consistent with the City CAP.

6.4 Local E-3: Voluntary Time-of-Sale Residential Energy Efficiency

GOAL: Create a voluntary time of sale residential efficiency improvements program to encourage homeowners to make energy upgrades along with the other upgrades that they are likely to make immediately following the purchase of a new home.

Measure Local E-3: Voluntary Time-Of-Sale Residential Energy Efficiency	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	Develop a voluntary time-of-sale efficiency upgrade program by 2015.
Responsible Department	Community Development
Monitoring	Track participation in the program as a % of home sales by 2016. In 2020 CAP, set a goal for % of home sales based on past performance.
Co-Benefits	Reduced energy use, reduced air pollution, resource conservation, and increased property values.

* Quantification not available for measures which were not included in the SANBAG Plan.

The City will create a voluntary time-of-sale efficiency upgrade program, which will create steady improvements in the energy efficiency of the existing building stock using turnover of homes in the community as an opportunity to provide energy efficiency information.

To ensure that this measure does not make homes in Chino less attractive to potential buyers, it will be voluntary. Once the City develops the program, it can be included in the disclosure packages that are given to buyers, describing what they can do if they choose to participate. This information will include a list of energy efficiency improvements that are generally effective in Chino, as well as information about performance-based measures that would provide a broader set of options more tailored to the home, but only after the completion of a basic

home energy audit. That audit might take the form of a Home Energy Rating System (HERS) rating, which tests a home and then makes recommendations for energy improvements that have been shown to be cost-effective. As the City develops the program, it will consider whether some costs associated with these upgrades can be reduced by crediting homebuyers for their plan check and other fees.

Such a program would be more effective if mandatory. For this reason, the City will also work with other jurisdictions in the region (San Bernardino County) to see if a regional approach applicable to all homes in the County can be created. This would create a level playing field for home sales transactions in the County and reduce the costs associated with administering the program by pooling resources among the jurisdictions.

6.5 Solar Measures on Buildings

GOAL: Achieve a target of 10% of new and existing buildings to incorporate photovoltaic systems by 2020. Solar energy systems will be a critical part of the City's emissions reduction strategy and will be applied to new and existing commercial, industrial, and residential buildings.

To implement this measure, the City of Chino will work with building owners, developers, state funding programs, and private companies to facilitate funding for solar energy projects. The HERO PACE program, described in Section 6.2, will be available to Chino residents and business owners by the end of this year as another source of possible financing of solar projects. Additionally, nonfinancial incentives, such as the High Efficiency Hot Water Distribution Program and the Energy Efficiency Benchmarking Program (both offered by SGC) are areas the City can consider to support this goal. Implementation of this measure will be gradual through 2020 as ever greater numbers of existing buildings and new developments are constructed and equipped with solar installations. A combination of natural market forces and emerging Statewide Zero Net Energy new construction standards (with a 2020 implementation target for residential construction) may help the City achieve this target without further action by the City itself.

Tracking: Because all photovoltaic installations require appropriate permitting from the City of Chino Building Division, the City should begin to assemble a database of photovoltaic installations in the City for both new and existing buildings. The data can be compared to overall new and existing building stock data in the City to assess achievement of the respective 10% targets.

If the tracking indicates that the 10% solar installation targets are not being met, the City should assess what part of the solar installation market is falling short (e.g. commercial new construction) and target solutions to improve solar installations in that market. The City should evaluate ways to increase the potential for solar to be provided, such as encouraging developers of new housing developments to incorporate improvements to make homes "solar-ready", such as installing electrical conduit for solar electric system wiring, installing plumbing for solar hot water systems, and providing space for a solar hot water storage tank.

6.5.1 Local E-4: Solar Installation for New Housing

GOAL: Achieve a target of 10% of new residential buildings to incorporate a solar component through the promotion of incentive programs offered by utility companies.

Measure Local E-4: Solar Installations for New Housing*	
Metric Tons CO2e Reduced from Baseline	359
Implementation Actions	1. Identify funding sources from state, county and utility programs for solar energy projects. 2. Prepare handouts for the public, provide information on the City's website, and identify city events such as the New Business Reception, job fairs, etc. where staff can distribute information.
Responsible Department	Community Development
Monitoring	Track % of new housing development that incorporates solar through building permit data base.
Co-Benefits	Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, public health improvements, and increased property values.

* From SANBAG Plan

To implement this measure, the City will promote programs such as the California Energy Commission's New Solar Homes Partnership and the PACE program. The California Energy Commission's New Solar Homes Partnership program provides rebates to developers of six units or more who offer solar power in 50% of new units. Other programs could be accessed, including private funding from firms focused on solar Power Purchase Agreements (PPAs). A PPA is a long term contract to buy electricity produced by the solar energy system. The term of the contract is typically 15 to 20 years. The site owner does not own the solar energy system during the term of the contract. At the end of the contract the homeowner will have the option to purchase the system for the remaining value of the system or having it removed. Some of these contracts also allow a customer to purchase the system before the end of the term of the contract. The cost of the electricity from the solar energy system may escalate over the term of the contract and the escalation rate will be specified in the contract. The escalation rate may or may not be at the same rate that the local utility will charge over the same period. The homeowner will still be a customer of the local utility and purchase electricity from the utility when the solar energy system does not produce electricity (such as overnight or on a cloudy day).[11]

[11] http://calseia.org/residential-leases-and-power-purchase-agreements/

6.5.2 Local E-5: Solar Installation for New Commercial/Industrial

GOAL: Achieve a target of 10% of new commercial and industrial buildings to incorporate a solar component.

Measure Local E-5: Solar Installations for New Commercial/Industrial*	
Metric Tons CO2e Reduced from Baseline	1,104
Implementation Actions	1. Identify funding sources from state, county and utility programs for solar energy projects. 2. Prepare handouts for the public, provide information on the City's website, and identify city events such as the New Business Reception, job fairs, etc. where staff can distribute information.
Responsible Department	Community Development
Monitoring	Track % of new commercial development that incorporates solar through building permit data base.
Co-Benefits	Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, public health improvements, and increased property values.

* From SANBAG Plan

To implement this measure, the City will work with private companies to provide funding for solar energy projects such as through PPAs. Other financing and installation models that facilitate the solar industry are likely to arise in the coming years and should be promoted by the City to facilitate solar power installations.

6.5.3 Local E-6: Solar Installation for Existing Housing

GOAL: Achieve a target of 10% of existing homes in Chino to incorporate a solar component through citywide promotion of solar installations.

Measure Local E-6: Solar Installations for Existing Housing*	
Metric Tons CO2e Reduced from Baseline	2,629
Implementation Actions	1. Identify funding sources from state, county and utility programs for solar energy projects. 2. Prepare handouts for the public, provide information on the City's website, and identify city events such as the New Business Reception, job fairs, etc. where staff can distribute information.
Responsible Department	Community Development
Monitoring	Track % of homes installing solar through building permit data base.
Co-Benefits	Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, public health improvements, and increased property values.

* From SANBAG Plan

6.5.4 Local E-7: Solar Installation for Existing Commercial / Industrial

Goal: Achieve a target of 10% of existing commercial and industrial buildings to incorporate solar components through citywide promotion.

Measure Local E-7: Solar Installations for Existing Commercial/Industrial*	
Metric Tons CO2e Reduced from Baseline	1,569
Implementation Actions	1. Identify funding sources from state, county and utility programs for solar energy projects. 2. Prepare handouts for the public, provide information on the City's website, and identify city events such as the New Business Reception, job fairs, etc. where staff can distribute information.
Responsible Department	Community Development
Monitoring	Track % of commercial/industrial remodels that incorporate solar through building permit data base.
Co-Benefits	Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, public health improvements, and increased property values.

* From SANBAG Plan

6.6 Local E-8: Energy Efficiency Equipment Upgrades at WWTPs

GOAL: Coordinate with local wastewater treatment provider (WWTP) to upgrade equipment.

Measure Local E-8: Energy Efficiency Equipment Upgrades at Waste Water Treatment Plants (WWTPs)*	
Metric Tons CO2e Reduced from Baseline	1,249
Implementation Actions	IEUA will upgrade pumping and treatment equipment. The upgrade of equipment is a onetime event, and implementation will be complete once the upgraded equipment begins operating.
Responsible Department	IEUA, with City coordination
Monitoring	Confirm implementation with IEUA
Co-Benefits	Reduced energy use and reduced air pollution.

* From SANBAG Plan

Chino will work with Inland Empire Utilities Agency (IEUA) or other local wastewater treatment provider to upgrade and replace wastewater treatment and pumping equipment with more energy-efficient equipment, as is financially feasible, at the existing facilities by 2020.This measure will specifically require all pumping and treatment equipment to be 25% more energy efficient at the time of replacement as compared to existing equipment. The City will utilize best management practices for the treatment of waste (California Air Pollution Control Officers Association 2009). This measure could also include the following:

- WWTPs may already have energy efficiency upgrades scheduled as part of their capital improvements program.
- Assess the feasibility of using advance treatment of recycled water with microfiltration or reverse osmosis for future potable water use. Assess associated energy/GHG tradeoffs vs. out of basin water supply.

6.7 Local E-9: Outdoor Lighting Upgrades for Existing Development

GOAL: The City will adopt outdoor lighting standards in the zoning ordinance to reduce electricity consumption above and beyond the requirements of AB 1109.

MEASURE LOCAL E-9 Outdoor Lighting Upgrades for Existing Development	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	1. Continue to monitor costs of outdoor lighting upgrades for city facilities to achieve the most cost effectiveness for replacement and schedule upgrade activities through the annual budget process. 2. Continue to pursue grant funding and participation in utility incentive programs 3. Promote private outdoor lighting upgrades. 4. Amend the Zoning Ordinance to adopt outdoor lighting standards that exceed the requirements of AB 1109 to reduce electricity consumption.
Responsible Department	Public Works
Monitoring	Track lighting upgrades completed for City facilities and for private building improvements.
Co-Benefits	Reduced energy use, reduced air pollution, increased property values, and increased quality of life.

*Quantification not available for measures which were not included in the SANBAG Plan.

Lighting requires the production of electricity to power the lights, which represents an indirect source of GHG emissions. Certain types of light fixtures can utilize less energy to obtain the same output. Replacing less efficient bulbs with energy-efficient bulbs therefore reduces energy consumption and in turn reduces GHG emissions. Installation of an outdoor LED fixture for residential lights achieves a 75% reduction in energy usage, relative to an incandescent bulb (source: US Environmental Protection Agency 2011a). For commercial lighting and traffic lights, LED's consume about 90% less energy than traditional incandescent lights (source: California Air Pollution Control Officers Association 2010).

The City has already begun replacement of outdoor lighting at certain parks, on city buildings and has replaced all traffic signal lights with LED lighting. There is currently a program in place whereby the traffic signal lights are replaced every 5 years, and each year, the replacement is scheduled and budgeted for rotating sectors of the City.

The City continues to actively pursue grant funding to complete additional lighting upgrades. The City will continue to replace its existing outdoor lighting with high-efficiency LED fixtures as those fixtures begin to demonstrate simple payback periods of three years or less. This cost effectiveness threshold should be assessed independently for fixtures that need replacement components due to subcomponent failures (such as a bulb burning out) and for the replacement of fully operational fixtures. The replacement-at-failure will usually be more cost effective. Caltrans does not yet require LED lighting, but is expected to in the future and has expressed a preference for such fixtures whenever possible on roadways. The City will continue to work with Caltrans on replacement of street lighting to LED once an acceptable lighting standard is established.

6.8 Local E-10: Construction Energy Use

GOAL: Reduce emissions from building construction by using cleaner fuels and equipment.

Measure Local E-10: Construction Energy Use	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	Develop construction best practice guidelines for companies working in Chino
Responsible Department	Community Development
Monitoring	Publish guidelines by 2016
Co-Benefits	Reduced energy use, reduced air pollution, public health improvements

*Quantification not available for measures which were not included in the SANBAG Plan.

The City will develop a program encouraging construction companies operating in Chino to use best practices with respect to fuel use and clean air equipment during construction operations.

6.9 Local E-11: Adopt Relevant Voluntary Measures from the California Green Building Standards Code

GOAL: Incorporate appropriate voluntary measures from the California Green Building Standards Code for residential, municipal, institutional, industrial, and commercial buildings in conjunction with each tri-annual update.

Measure Local E-11: Adopt Relevant Voluntary Measures from the California Green Building Standards Code	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	Adopt relevant California Green Buildings Standards
Responsible Department	Community Development
Monitoring	Review and adopt selected California Green Building Standards by 2015 (for code available in 2014) and by 2018 (for code available in 2017)
Co-Benefits	Reduced energy consumption, reduced air pollution, public health improvements

* Quantification not available for measures which were not included in the SANBAG Plan.

As the code is updated on a triennial cycle, City staff will review the voluntary measures to determine which are appropriate to make mandatory in Chino. This must be done each time it is updated, as many of the voluntary items from the last cycle will become mandatory in a new cycle consistent with the state's effort to move toward zero net energy buildings. The City will review the appropriateness and practicality of implementing some of the voluntary measures, and coordinate with representatives of the development community on their implementation.

6.10 Local E-12: Implement SB X7-7 - Energy Savings from Reduced Water Use

GOAL: Comply with the mandate of SB X7-7.

Local E-12: Implement SB X7-7 - Energy Savings from Reduced Water Use *	
Metric Tons CO2e Reduced from Baseline	24,381
Implementation Actions	Implement the 2010 Urban Water Management Plan (UWMP).
Responsible Department	Public Works, with IEUA
Monitoring	100% of new buildings compliant with water conservation measures in Urban Water Management Plan by 2020. Monitor water consumption on a per capita basis using the same methodology as the UWMP.
Co-Benefits	Reduced water and energy use, reduced air pollution, resource conservation, and reduced water infrastructure costs.

* From SANBAG Plan

SBX7-7 was enacted in November 2009 and requires urban water agencies throughout California to increase conservation to achieve a statewide goal of a 20% reduction in urban per capita use (compared to nominal 2005 levels) by December 31, 2020 (referred to as the "20X2020 goal"). Implementation will be gradual through 2020 as new buildings are constructed with water-efficient fixtures and other conservation measures are put into place.

Through the City's Urban Water Management Plan adopted in 2010, the City has determined its daily water per capita use for the years 2015 and 2020. This information will be used to determine the City's progress towards compliance with its Urban Water Use Target for 2015 and 2020. Determining and tracking use levels and targets will support the goal of reducing the state's per capita urban water consumption by 20%.

6.11 Local E-13: Voluntary Green Business Certification Program

GOAL: The City will assist local businesses in identifying ways they can operate more sustainably.

Measure Local E-13: Voluntary Green Business Certification Program	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	Review green business certification programs from other communities. Identify whether the programs will be a good fit in Chino. Implement a selected program tailored to Chino businesses
Responsible Department	Community Development
Monitoring	Number of businesses participating in the program
Co-Benefits	Reduced energy consumption, awareness of new energy-saving techniques

* Quantification not available for measures which were not included in the SANBAG Plan.

The City will explore the development of a Green Business Certification Program which will recognize businesses that voluntarily develop and implement energy conservation programs, including energy efficiency improvements, recycling, energy-efficient heating and cooling systems, etc. The incentive for businesses to participate is publicity resulting from their efforts, the ability to advertise as a certified green business, and a cost savings from the associated energy reduction.

7 Local On-Road Transportation Measures

7.1 Local T-1: Smart Bus Technologies

GOAL: Collaborate with Omnitrans to implement "Smart Bus" technology, global positioning system (GPS), and electronic displays at all transit stops by 2020 to provide customers with "real-time" arrival and departure time information

Measure Local T-1: "Smart Bus" Technologies*	
Metric Tons CO2e Reduced from Baseline	436
Implementation Actions	1. Install Automatic Vehicle Location system on Omnitrans buses. 2. Provide information about bus location and arrival time. 3. Publicize the new system to transit riders and potential riders in Chino, including City staff.
Responsible Department	Public Works with OmniTrans
Monitoring	Ongoing monitoring will be conducted by Omnitrans.
Co-Benefits	Reduced air pollution, public health improvements, and increased quality of life.

* From SANBAG Plan

Smart Bus Technologies include Automatic Vehicle Location (AVL) systems and real-time passenger information at bus stations. Omnitrans plans to implement these technologies system-wide on all bus routes serving San Bernardino Valley (Omnitrans service area) to enable information sharing, enhance rider services, and attract potential riders. The AVL system has already been implemented. The Bus Arrival Prediction Information System (BAPIS) will be installed in two phases. In Phase I, real-time rider information will be available via text messaging, Quick Response (QR), website, Interactive Voice Response (IVR), and mobile phone devices. In Phase II, Omnitrans will install electronic signs at all major transit hubs and provide General Transit Feed Specification (GTFS) data to the general public to build apps for mobile devices like smartphones and tablet computers. These systems not only allow riders to know exactly when the next vehicle will be arriving, but also enable the system operator to track, schedule, and repair vehicles in service. Providing better information to passengers about scheduled arrivals can result in dramatic increases in passengers' perceptions of the service, even if the actual service provided is the same in terms of frequency and on-time arrivals (California Air Pollution Control Officers Association 2009).

In Chino, this presents an opportunity to make taking transit more convenient by allowing residents to wait at home or in their place of work until the bus is close by, reducing wait times at bus stops. The knowledge that the bus is truly coming

using such systems is a powerful incentive to move people who have a choice toward riding transit. The City will promote the new system to existing and potential riders and encourage them to try transit again, even if they have tried it before, because the system transforms the rider experience.

7.2 Local T-2: Bicycle Master Plan

GOAL: Prepare a Bicycle Master Plan, identifying how the City's bicycle network will be expanded, including on-road enhancements and identification of opportunities for off-road trails.

Measure Local T-2: Bicycle Master Plan	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	1. Apply for funding to prepare a Bicycle Master Plan+ 2. Develop and adopt a Bicycle Master Plan
Responsible Department	Community Development and Public Works
Monitoring	Identify key partners for Master Plan development and implementation by 2014 Initiate outreach to key partners for Master Plan development and implementation by 2014 Implementation of first project identified by Master Plan within two years of Master Plan adoption
Co-Benefits	Reduced air pollution; increased opportunities for healthy transportation and recreation

* Quantification not available for measures which were not included in the SANBAG Plan.

+ The City has been awarded two grants to fund this work as of December 2013 and anticipates completion of the work by 2016.

Bicycling provides an opportunity for healthy transportation, recreation, and can ease traffic on congested local streets. Chino is an ideal location for bicycling because it is generally flat, has a grid network of streets that allow cyclists to traverse the City on roadways with less vehicle traffic, and has opportunities for off-street bicycle and mixed-use paths along existing utility corridors and other rights-of-way. The City will work with partner organizations to prepare a Bicycle Master Plan that identifies the specific improvements necessary to make bicycling a practical alternative in Chino, including reviewing bicycle parking and other facilities. Partners should include school representatives, neighborhood associations, local and regional bicycle advocates, and the Healthy Chino Coalition. The Healthy Chino Coalition was formed in 2004, in response to the health epidemic affecting the nation. The Coalition is comprised of community leaders, schools, business leaders, churches, service organizations, and concerned individuals who are working together to provide healthy options for children, youth, and adults

7.3 Local T-3: Pedestrian Master Plan

GOAL: Prepare a Pedestrian Master Plan, identifying how the City's pedestrian transportation system will be expanded, including sidewalk and intersection improvements, streetscape improvements, and joint-use of off-street trails.

Measure Local T-3: Pedestrian Master Plan	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	1. Apply for funding to prepare a Pedestrian Master Plan[+] 2. Develop and adopt a Pedestrian Master Plan
Responsible Department	Community Development and Public Works
Monitoring	Identify key partners for Master Plan development and implementation by 2014 Initiate outreach to key partners for Master Plan development and implementation by 2014 Implementation of first project identified by Master Plan within two years of Master Plan adoption
Co-Benefits	Reduced air pollution; increased opportunities for healthy transportation and recreation

* Quantification not available for measures which were not included in the SANBAG Plan.

[+] The City has been awarded two grants to fund this work as of December 2013 and anticipates completion of the work by 2016.

Walking is already a popular activity in Chino, with the well-established Chino Walks program under way for many years. There are opportunities to improve the pedestrian transportation system by identifying pedestrian connections between neighborhoods and key destinations such as shopping, schools, and parks. The City will work with partner organizations to develop a plan that addresses these connections through network improvements and streetscape improvements such as street trees, sidewalks, benches, planter boxes, and Americans with Disability Act (ADA) access. It will also consider off-street trails, particularly multi-use trails. Partners should include school representatives, neighborhood associations, Chino Walks, and the Healthy Chino Coalition.

7.4 Local T-4: Transportation Demand Management

GOAL: Establish a Transportation Demand Management (TDM) program, focusing on Downtown Chino and other locations in the City with concentrations of employees. Examine key types of employers, such as warehouse and industrial areas, to determine how they could best be served by a TDM program.

Measure Local T-4: Transportation Demand Management	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	Develop a Transportation Demand Management Program and Amend the Zoning Ordinance to require TDM programs for applicable development projects.
Responsible Department	Community Development and Public Works in coordination with Omnitrans
Monitoring	Number of employers participating in TDM programs. Number of City of Chino staff members participating in TDM program.
Co-Benefits	Reduced air pollution; increased transit convenience for participating employees; recruiting feature for participating employers

* Quantification not available for measures which were not included in the SANBAG Plan.

TDM programs rely on the fact that information is often all that stands between commuters and the alternatives that could save them time and money. They provide information and incentives to encourage employees to carpool, such as identifying employees who live near one another and helping them develop a plan to ride-share. Technological solutions to encourage ride-sharing are expanding rapidly. The TDM program will explore the use of ride-sharing technology along with more traditional incentives such as transit passes, which could be implemented as a trial program in collaboration with Omnitrans.

7.5 Local T-5: Urban Forest Master Plan

GOAL: The City will prepare an Urban Forest Master Plan.,

Measure Local T-5: Urban Forest Plan	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	1. Complete database of existing trees. 2. Seek funding to develop an Urban Forest Master Plan. 3. Develop and adopt an Urban Forest Master Plan.
Responsible Department	Public Works and Community Development
Monitoring	Data Base completed by 2015 Plan adoption by 2018 Implementation of first project identified by Plan by 2019
Co-Benefits	Reduced air pollution; increased quality of life; increased property values

*Quantification not available for measures which were not included in the SANBAG Plan.

The Urban Forest Master Plan will include an inventory of all existing trees on public property, including public parks, rights-of-way, and at City facilities. This plan will help the City to schedule and budget for the maintenance of existing trees, and will also identify areas where trees are missing or can be added to contribute to reducing street-level temperatures for pedestrians and nearby buildings. The plan will also establish a city-wide tree planting goal and tree preservation measures.

The City is creating a city-wide database of existing trees on public property, which will include the tree's location and species. The inventory will also identify areas throughout the City where trees should be located as part of future plantings. As a source of shade and beautification along sidewalks, bike lanes, and in parks, trees can make walking and bicycling more pleasant, and thereby encourage use of active travel modes. By shading the street, trees also can reduce the relatively high ambient temperatures in urban areas (i.e., the heat island effect), and thereby reduce the need for use of air conditioning in nearby buildings and cars. While trees grow, they also collect and store (i.e., "sequester") a limited amount of CO_2 from the atmosphere. When native tree species are selected, trees also help provide habitat for native species of birds, insects, and other animals. The City will work with neighborhood groups to identify trees appropriate to the character of streets and parks in different areas of the City, as well as with appropriate advisors on the types of trees that will best cool streets and buildings.

8 Local Solid Waste Management Measures

8.1 Local WA-1: Waste Diversion Program

GOAL: Achieve the State-wide diversion goal of 75% by implementing waste diversion programs outlined in Assembly Bills 32, 341, 939 and CALGreen.

Measure Local WA-1: Increased Waste Diversion*	
Metric Tons CO2e Reduced from Baseline	183
Implementation Actions	1. Implement single-source recycling at multi-family dwellings mandated by AB 341. This program will be phased in over the next 2-years and will be ongoing. 2. Implement recycling at commercial premises mandated by AB 341. This program will be phased in over the next 2-years and will be ongoing. 3. Work with the waste hauler in implementing a food waste program. 4. Continue to work with the Solid Waste Advisory Technical Committee in analyzing the solid waste industry in creating markets for organics recycling. 5. Continue public outreach and education at schools, community events, and other appropriate venues.
Responsible Department	Public Works
Monitoring	Continue to prepare Annual Report to CalRecycle, which monitors solid waste diversion performance for local jurisdictions.
Co-Benefits	Reduced air pollution, increased diversion, and increased sustainability

* From SANBAG Plan

The City already has an adopted construction waste diversion requirement of 65%, which exceeds the CALGreen requirement of 50%. AB 939 requires the City of Chino to divert 50% of its waste away from the landfill. The City is currently at 72% diversion for 2011, which is due to the many waste diversion programs the City provides its residents and businesses. The City's waste diversion programs include, but are not limited to construction and demolition debris, green waste, single-stream recycling, white goods, electronics, household hazardous waste, tires, scrap metal, inert materials and more. The City staff continues to work with Waste Management, Inc. (the franchised hauler) to expand and or establish new waste diversion programs whenever possible; especially, programs targeted under AB 341, 939 and CALGreen. Together, the City and Waste Management will identify diversion opportunities and achieve the State-wide diversion goal of 75%.

This measure will include:

1. Expanding educational programs to inform residents about reuse, recycling, composting, waste to energy, and zero waste programs. Encourage local recycling and composting initiatives at the community level through education outreach.
2. Continue Earth Day at local schools. These 1-day events encompass every aspect of environmental sustainability and reach over 5,000 school-age children annually.
3. Adopt a construction and demolition waste recovery ordinance that meets the CALGreen voluntary guidance of a 50% to 75% reduction in nonhazardous construction and demolition waste.
4. Encourage local businesses to expand their recycling and composting efforts and to reduce packaging of products manufactured in the cities.
5. Offer waste audits to commercial customers to enhance or implement effective recycling programs.
6. Offer cost effective recycling services to multi-family and commercial customers through a bundled rate program approved through Proposition 218.
7. Enhance regional coordination on waste management issues, to take advantage of economies of scale of recycling, composting, and other diversion programs.
8. Work as a member of the Solid Waste Advisory Technical Committee to analyze potential markets for organics that would not otherwise exist in San Bernardino County.
9. Apply for grant funding to purchase alternative fuel vehicles in accordance with Fleet Rules imposed by the South Coast Air Quality Management District (SCAQMD).
10. Work with Waste Management in its Phase II CNG Fueling Station Project that will be open to the public.
11. Work with Waste Management on their continued efforts to phase in 100% alternative fuel vehicles mandated under SCAQMD's Fleet Rules over the next 3-years.

9 Local Wastewater Treatment Measures

9.1 Local WW-1: Recycled Water

GOAL: The City will continue existing efforts to require appropriate businesses and industries to use recycled water for irrigation and other non-potable uses.

Measure Local WW-1: Recycled Water	
Metric Tons CO2e Reduced from Baseline	N/A*
Implementation Actions	1. Work with the Inland Empire Utilities Agency to identify new locations/uses for recycled water. 2. Through the Development Review process, work with businesses and developers to provide for connections to recycled water where possible. 3. Review the Municipal Code to identify any barriers to the use of recycled water, and modify accordingly to increase opportunities for recycled water use. 4. Develop public educational materials that support and encourage the use of recycled water and other water conservation measures. 5. Support IEUA in their efforts to utilize recycled water as a resource for groundwater recharge in the Chino Groundwater Basin.
Responsible Department	Public Works
Monitoring	Track recycled water consumption by residential, commercial, and industrial users. This usage correlates to the amount of potable water usage that has been reduced.
Co-Benefits	Reduced water use and savings on development of new potable water sources.

*Quantification not available for measures which were not included in the SANBAG Plan.

Reuse of highly treated recycled water is an available source of water to meet the growing water demands of the City, and can greatly reduce the City's reliance on potable water supplies. Re-using water locally and implementing water conservation measures saves greenhouse gas emissions associated with transporting potable water from distant locations to the City. Water use efficiency and water resource management is the foundation for the City's Urban Water Management Plan (UWMP) which was adopted in 2010. Reducing demand for potable water by increasing recycled supply is one of the primary goals of the Plan. The City has an adopted policy that recycled water shall be used for any purposes approved for recycling water use, when it is economically, technically and institutionally feasible. In addition, the policy states that recycled water shall be the primary source of supply for commercial and industrial uses, whenever available and/or feasible.

Recycled water is supplied to the City by the Inland Empire Utilities Agency (IEUA), and the City currently provides recycled water to many industrial, landscape irrigation, and agricultural customers (source: UWMP 2010). Future improvements to the City's recycled water system must work in coordination with IEUA Regional Recycled Water System improvements. Future planned recycled water system improvements include:

- Construction of a recycled water connection on Ramona Avenue (estimated completion date June 2017);
- Extension of the recycled water line at Yorba and Monte Vista Avenues (estimated completion date June 2017); and
- Extension of the recycled water line on Schaefer Avenue (estimated completion date of June 2018).

These improvements will provide recycled water to serve commercial and industrial businesses, a private school, the Public Works Service Center, Villa Park, and the Fire District station/training center.

9.2 Local WW-2: Implement SB X7-7: Energy Savings from Wastewater Treatment

See Local E-12 for information on this measure. The benefits extend to reduced energy use for wastewater treatment because reductions in water use result in reductions in wastewater generation.

10 Local Water Conveyance Measures

10.1 Local W-1: Encourage Water-Efficient Landscaping Practices

Goal: The City will encourage water-efficient landscaping practices for homeowners, businesses and non-residential property owners.

Measure Local W-1: Encourage Water-Efficient Landscaping Practices*	
Metric Tons CO2e Reduced from Baseline	754
Implementation Actions	Adopt a landscaping water conservation ordinance that exceeds the requirements in the Model Landscape Ordinance (AB 1881).
Responsible Department	Community Development and Public Works
Monitoring	Plan adoption by 2018 Required plan measures in 100% of applications by 2019 Downward trend in per-capita water use by 2020
Co-Benefits	Reduced energy use, reduced air pollution, and resource conservation

* From SANBAG Plan

Water use contributes to GHG emissions indirectly, via the production of the electricity that is used to pump, treat, and distribute the water. Homes and businesses consume a significant amount of water through outdoor water use, which includes landscape irrigation. Designing water efficient landscapes for a project site reduces water consumption and the associated indirect GHG emissions.

The City will consider incorporating the following provisions in the conservation ordinance:

1. Further reducing the Evapotranspiration (ET) Adjustment factor listed in the Model Ordinance.
2. Limiting turf grass areas.
3. Providing approved plant lists that include low-water usage plant materials such as California native species, vegetation that is appropriate for the climate, and provide for the planting of complementary plants with similar water needs or which can provide each other with shade and/or water.

In addition, the City will work with IEUA to conduct the following activities:

4. Implementing a public education and outreach campaign to promote water conservation. The program should highlight specific water-wasting activities to discourage, such as watering during peak daylight hours, water use resulting in flooding or runoff, the watering of non-vegetated surfaces and using water to clean sidewalks and driveways, as well as educate the community about the importance of water conserving techniques. Water

efficiency training and certification for irrigation designers, installers, and property managers should also be offered.

5. Encourage alternatives to lawns and turf uses, except for parks, playing fields, children's play areas, and other specialized uses.
6. Promote underground irrigation techniques.
7. Encourage extensive use of mulch in landscape areas to improve the water-holding capacity of the soil by reducing evaporation and soil compaction.
8. Require drought-tolerant landscape plantings for all municipal buildings.
9. Promote installation of dual plumbing in all new development, allowing gray water to be used for landscape irrigation where purple pipe is not an option.

10.2 Local W-2: Implement SB X7-7: Energy Savings from Water Conveyance

See Local E-12 for information on this measure. The benefits extend to water conveyance because a smaller volume of water must be moved to businesses and residences in Chino.

11 Municipal Reduction Measures

Implementation of municipal reduction measures provides an opportunity for the City to set an example for residents, business owners, and the development community. The City has already implemented a number of activities to improve the energy efficiency of city buildings, equipment, and vehicles and is committed to continuing this effort through this CAP. In 2007, the City developed a city-wide energy upgrade program that identified a variety of energy upgrades to be completed to replace equipment, vehicles, windows, and lighting in a number of City buildings and parks. To date, the City has completed or is in the process of completing a number of energy-efficiency activities including:

- The three most recent new municipal buildings were designed to meet LEED (Leadership in Energy and Environmental Design) standards; this includes the two state-of-the-art fire stations and the police headquarters.
- Lighting upgrades to LED lights in ten of the City's parks and installation of electronic ballasts, lamps, and occupancy motion sensors in City buildings.
- Replacement of HVAC units with programmable thermostats, water heaters, boilers and other equipment in City buildings.
- Conversion of vehicles and equipment to natural gas (the conversion schedule is expected to be complete by 2030, as the vehicles near the end of their lifecycles).
- Installation of energy efficient windows and weather stripping in City buildings.

In addition, the City has participated in regional efforts to address the impacts of global warming on a more regional level by participating in the Green Valley Initiative (GVI) since 2009, along with other cities and districts in San Bernardino and Riverside Counties. This initiative functions to:

- Educate City staff, the public and local businesses about the importance of sustainability;
- Continue to promote recycling programs and efforts;
- Conserve valuable resources such as water and energy while promoting the use and production of new and renewable energy sources.

To date, the City has spent approximately $1.6 million on replacement of vehicles with CNG vehicles, and has budgeted funds to replace additional vehicles in FY 2014/15. The City has actively pursued grant funding to implement these activities, and will continue to utilize available funding sources toward the energy upgrade program. In addition to these ongoing efforts, the City will undertake a full inventory of greenhouse gases associated with its operations. This inventory will use a tool provided to all Partnership cities participating in the SANBAG project. Following preparation of the inventory, City staff will review the results to identify key activities that will most cost-effectively reduce GHG emissions from municipal operations. The City will consider ideas such as the following:

1. Additional vehicle fleet efficiency measures.
2. Limiting idling of city fleet vehicles.
3. Installation of efficient outdoor lighting fixtures, such as street lights (consistent with the outdoor lighting program described in Chapter 6).
4. Encouraging employees to carpool or take transit (consistent with the TDM program prepared as described in Chapter 7).
5. Additional building upgrades to lighting, heating, and cooling systems, as well as insulation.
6. Explore opportunities to educate the public about the importance of energy efficiency.

12 Adaptation Measures

The actions that the City is taking through this CAP, supporting actions by other communities throughout the state, will take years to implement, and further time to reduce or eventually reverse the effects of climate change. For this reason, it is important that the community be prepared for climate change, including readiness to adapt to its predicted impacts. Adaptive measures are the actions the City is undertaking to prepare for and respond to changes in the climate or the environment. This chapter highlights adaptation strategies specific to Chino, relying upon the predicted impacts described in Chapter 2.

It is important to note that there is a range of adaptation strategies: some are more complementary to the climate action strategies in this CAP than others. Figure 3 highlights examples of actions that help achieve both goals of slowing climate change and also helping adapt to climate change impacts, in contrast to actions that conflict with either or both goals. All actions included in Chino's Adaptation Measures and the measures described in Chapters 6 through 11 of this CAP are favourable actions because they slow climate change and are neutral or positive for mitigation.

In addition to the goals of climate action and climate change adaptation, all adaptation strategies have been reviewed to ensure they are achievable. Through partnerships with relevant agencies, many of the strategies ensure that City staff will benefit from expertise and assistance from key agencies at the county-, regional-, state- and federal levels.

Figure 3: Actions that Complement and Conflict with Adaptation to Climate Change

Favorable actions ⟷ **Unfavorable actions**

Favorable for adaptation and mitigation efforts	Favorable for mitigation, but unfavorable for adaptation efforts	Favorable for adaptation, but unfavorable for mitigation efforts	Unfavorable for adaptation and mitigation efforts
Energy demand management	Forestry with non-native species	Meeting peak energy demand with fossil fuels	Development in floodplains
Energy efficient buildings	Urban forestry (shade trees) with high water demand	Wastewater recycling and desalination	Traditional "sprawl" development
Water conservation	Some biofuels production	Groundwater banking	Development in hotter regions
Biodiversity-oriented forestry		Increased air conditioner use	
"Smart growth"		Use of drainage pumps in low-lying areas	
Development in cooler regions			

Source: Public Policy Institute of California, 2008.

12.1 Adaptation Measures

As noted in Chapter 2 of this CAP, the most prominent local effects of climate change in Chino are expected to be heat-related. The City will also experience the same water- and energy-supply concerns as the rest of Southern California. The City will focus on local efforts that mitigate these impacts in ways that improve quality of life for Chino's residents such as:

Adaptation-1: Cooling centers

The City will continue to provide cooling centers during heat waves, and will publicize their hours and locations clearly to ensure residents know of these opportunities to prevent heat-related illnesses

The City is already undertaking this adaptation strategy and will monitor locations and participation to ensure that the cooling centers are having the greatest possible impact.

Adaptation-2: Heat island mitigation

The City will prepare a heat island mitigation plan, referencing key actions from the tree planting plan, bicycle master plan, and pedestrian master plan described in Chapter 7 of this CAP, and adding actions specific to reducing the urban heat island effect.

The City can mitigate the heat island effect by updating its streets, buildings, and open spaces. The heat island mitigation plan will consider approaches to require or encourage:

- Prioritizing landscaped areas over hardscape on public and private property.
- Cool roofs, green roofs, and cool pavement for public and private property.

Adaptation-3: On-site energy production

As part of the City's efforts to reduce energy use in City buildings, it will focus on identifying opportunities for on-site energy production.

Energy supplies may be jeopardized by rising levels of energy use, reduced power production from dams in the Sierras, or other impacts. On-site, renewable energy sources can provide more dependable energy systems during emergencies and reduce demand on the energy system overall.

Adaptation-4: Groundwater infiltration

Continue to encourage site design for public and private buildings that reduces impervious surfaces, allowing increased groundwater infiltration.

Because Chino relies heavily on groundwater supply, and because surface water supplies from the Sierra and other parts of the state may become less reliable, a focus on protecting groundwater supplies will help the City continue to supply water even during times of scarcity.

12.2 Climate Action Measures Assisting Adaptation

Eleven of the GHG Reduction measures included in this CAP, and shown in Table 5, will also help the City adapt to the effects of climate change.

Table 5: Summary of Adaptive Climate Action Measures

No.	Title	Adaptive Benefit
ADAPTIVE BUILDING ENERGY ADAPTIVE STRATEGIES		
Local E-1	Energy Efficiency for Existing Buildings	To reduce energy supply uncertainty.
Local E-2	Energy Savings for New Development	To reduce energy supply uncertainty.
Local E-3	Voluntary Time-of-Sale Residential Energy Efficiency	To reduce energy supply uncertainty.
Local E-4	Solar Installation for New Housing	To reduce energy supply uncertainty.
Local E-5	Solar Installation for New Commercial / Industrial	To reduce energy supply uncertainty.
Local E-6	Solar Installation for Existing Housing	To reduce energy supply uncertainty.
Local E-7	Solar Installation for Existing Commercial / Industrial	To reduce energy supply uncertainty.
Local E-8	Equipment Upgrades	To reduce energy supply uncertainty.
Local E-9	Outdoor Lighting Upgrades for Existing Development	To reduce water supply uncertainty.

Table 5: Summary of Adaptive Climate Action Measures (continued)

No.	Title	Adaptive Benefit
ADAPTIVE TRANSPORTATION STRATEGIES		
Local T-1	Smart Bus Technologies	To reduce air pollution.
Local T-5	Urban Forest Plan	To reduce urban heat island.
ADAPTIVE SOLID WASTE MANAGEMENT STRATEGIES		
Local WA-2	Waste Diversion	To reduce energy supply uncertainty and air pollution.
ADAPTIVE WATER CONVEYANCE STRATEGIES		
Local W-1	Water-Efficient Landscaping Practices	To reduce energy and water supply uncertainty.

13 Implementation and Monitoring

13.1 Looking ahead to 2020

AB 32 commits California to return to 1990 emission levels by 2020. The Chino CAP is designed to document the City's efforts to contribute to that goal through a number of reduction measures. The CAP provides the City with a number of benefits, as described in Chapters 6 through 11, and including:

- Assessment of all GHG emission sources comprehensively and consistently instead of individually for different projects.
- Streamlining of project approvals and CEQA by providing tiering from a local reduction plan and its associated CEQA document.
- Strategic evaluation of overall GHG emissions reductions measures, including reduction effectiveness, costs and savings, and other community co-benefits, such as improved air quality.
- Selection of feasible and cost-effective means to reduce GHG emissions including many that can save money for municipal governments, businesses, individuals, and the community as a whole.
- Identification of the local role in reducing GHG emissions in the context of State efforts.
- Identification of credit for prior and on-going City actions.

The City recognizes that 2020 is not the end of the journey but a launching point for addressing issues related to climate change. This CAP is intended to be a starting point, initiating GHG reduction efforts that benefit the community and evaluating them in terms of efficacy, cost-effectiveness, and identifying future actions.

By 2020, the City will prepare a revision to this CAP, including an updated inventory and forecast, as well as additional reduction measures

13.2 Implementation

Meeting the reduction target set by the City and achieving GHG reduction benefits will require participation of all City departments and the community at large. Full implementation of the CAP will also benefit from communication and coordination between Chino, other partnership cities, and SANBAG to identify cost effective means of implementation wherever possible. This section outlines the key steps that Chino will follow to ensure that the measures it has identified for the CAP can be implemented effectively and efficiently.

Underlying all of the implementation measures is the need for flexibility. Because this is the City's first CAP, it will need to review the greenhouse gas reduction measures as they are implemented, change those that are not performing as expected, and firmly embrace those that outperform expectations.

Successful implementation of the CAP will require the following components, which are described in more detail below.

- Administration and staffing
- Timelines for measure implementation
- Community outreach and education
- Monitoring, reporting, and adaptive management
- Regional coordination

Administration and Staffing

The City will appoint a CAP Implementation Team (CIT), consisting of city staff from key departments, to support implementation of the GHG reduction measures. The CIT will be comprised of existing staff and does not require dedicated full-time staff. Members from the following City departments should be included to support the CIT roles as noted below:

- Office of the City Attorney—Responsible for providing legal advice related to the development of new policies, programs, and requirements.
- Office of the City Clerk—Responsible for maintaining monitoring and reporting records.
- Community Development Department - Planning and Building Divisions—Responsible for providing expertise in evaluating and managing the community impacts of the CAP, including implementation of the Building Energy measures and the Transportation Measures
- Public Works Department—Responsible for providing expertise on the development and implementation of transportation (as it relates to capital projects and maintenance), water, wastewater, city tree master plan, and solid waste reduction measures.

The specific responsibilities of the CIT will need to be developed, but could include:

- Securing long-term financing for GHG reduction measures (i.e., grant application primary contact).
- Serving as the external communication hub to local and regional climate action organizations including SANBAG.
- Conducting public outreach to inform the community of the City's greenhouse gas reduction efforts and how individuals can participate.
- Investigating methods to utilize existing resources and harness community support to streamline implementation of the local CAP.
- Development of a protocol for monitoring the effectiveness of emissions reduction programs.
- Establishing guidelines for reporting and documenting emissions reduction progress.

- Submittal of annual reports to the City Council.
- Amend or develop new CAP measures for approval by the City Council.
- Development of a protocol for utilizing the real-time information collected through the verification process to modify and revise existing reduction programs.
- Tracking state and federal legislation and its applicability to the City.

Funding and Budgets

Implementation of the GHG reduction measures in this CAP will require the City and other public agencies, local businesses, developers/builders, and existing commercial building owners and residential homeowners and individuals to incur increased costs for the capital improvements and other investments, and increased operations and maintenance costs. In some cases operating costs are anticipated to decrease, resulting in offsetting savings. A detailed summary of funding and financing options is available in Appendix E.

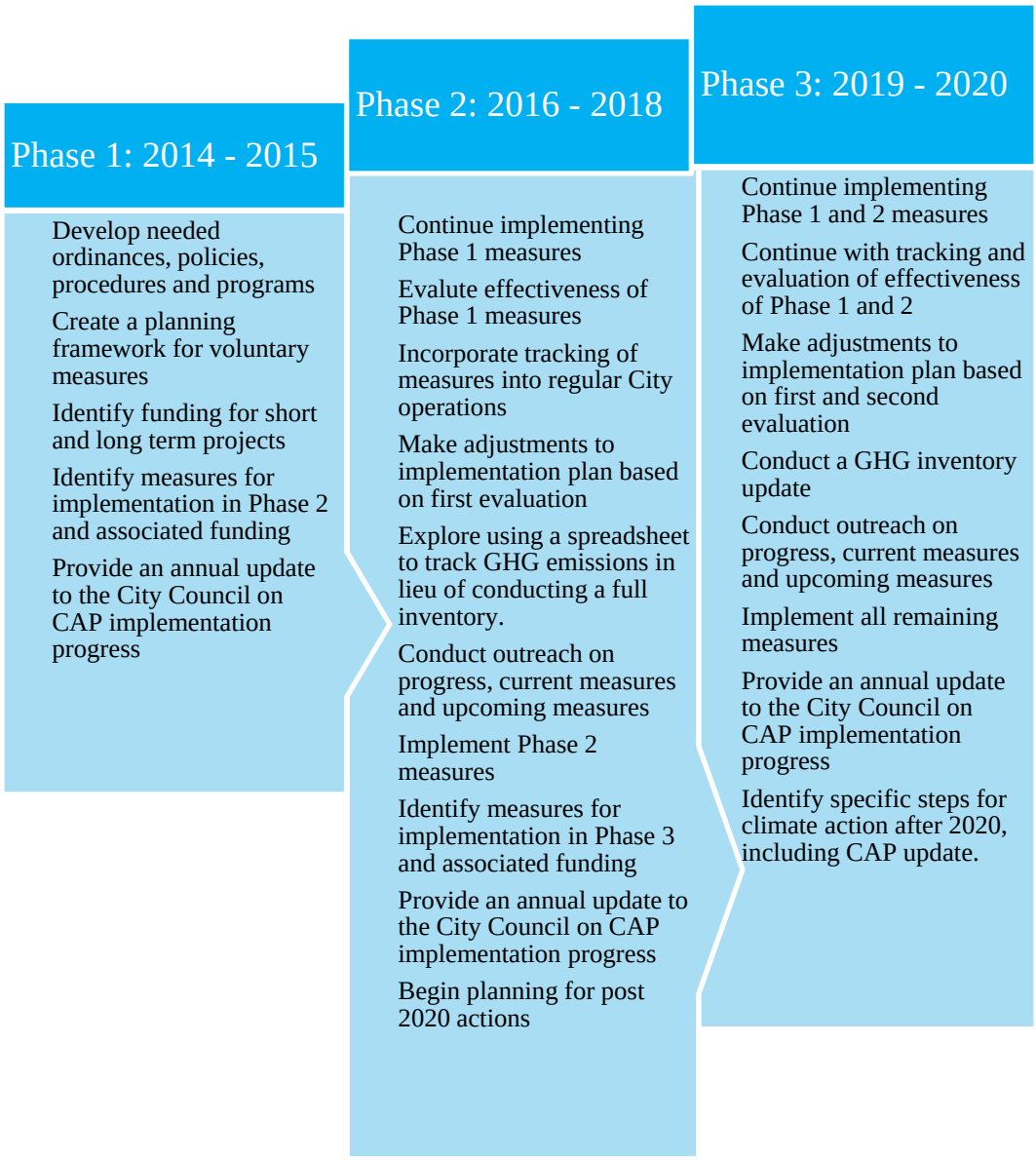
In addition to pursuing the funding options above and monitoring the availability of others, the City will take the following steps in order to best inform decisions related to the cost of GHG reductions measures:

- *Perform and Refine cost estimates*. Staff will review the cost of potential GHG reduction programs and products based on product information, internal estimates of level of effort needed to implement, or conversations with other communities that have implemented the programs, compare those costs to the expected GHG savings, and analyze the cost-effectiveness before recommending that the programs or products be undertaken. As programs are developed, cost estimates should be refined and updated over time with more precise implementation-level data.
- *Integrate GHG measures into existing City budget and CIP*. The City will review its CIP and facility master plan programs for consistency with the CAP.
- *Adopt or update ordinances and/or codes*. Some local reduction measures may represent a continuation of recently enacted ordinances while others will require new ordinances. Community Development staff will need to coordinate these efforts in conjunction with the CIT.
- *Pursue outside funding sources*. A range of funding from state and federal agencies has been identified (see Appendix E). The City will need to pursue these and other emerging funding sources as a part of implementation efforts.
- *Create monitoring/tracking processes*. Local reduction measures will require program development, tracking, and/or monitoring.

Implementation Timeline

It is anticipated that the City will implement its CAP in phases. Figure 4 shows an outline of key priorities for three implementation phases. The phasing described requires as a first step that Chino develop a CAP Implementation Timeline. Each conceptual phase is discussed in more detail below.

Figure 4: Phased Implementation Timeline


Phase 1: 2014 - 2015
Develop needed ordinances, policies, procedures and programs
Create a planning framework for voluntary measures
Identify funding for short and long term projects
Identify measures for implementation in Phase 2 and associated funding
Provide an annual update to the City Council on CAP implementation progress
Phase 2: 2016 - 2018
Continue implementing Phase 1 measures
Evalute effectiveness of Phase 1 measures
Incorporate tracking of measures into regular City operations
Make adjustments to implementation plan based on first evaluation
Explore using a spreadsheet to track GHG emissions in lieu of conducting a full inventory.
Conduct outreach on progress, current measures and upcoming measures
Implement Phase 2 measures
Identify measures for implementation in Phase 3 and associated funding
Provide an annual update to the City Council on CAP implementation progress
Begin planning for post 2020 actions
Phase 3: 2019 - 2020
Continue implementing Phase 1 and 2 measures
Continue with tracking and evaluation of effectiveness of Phase 1 and 2
Make adjustments to implementation plan based on first and second evaluation
Conduct a GHG inventory update
Conduct outreach on progress, current measures and upcoming measures
Implement all remaining measures
Provide an annual update to the City Council on CAP implementation progress
Identify specific steps for climate action after 2020, including CAP update.

To encourage implementation of all reduction measures, the CIT, with consultation from the Planning Commission, City Council, City staff and/or other key stakeholders, will develop a CAP Implementation Timeline. Measure prioritization will consider the following factors:

- Cost/Funding—How much does the measure cost? Is funding already in place for the measure?
- Greenhouse Gas Reductions—How effective is the measure at reducing greenhouse gases?
- Other Benefits—For example, does the measure improve water quality or conserve resources? Will it create jobs or enhance community well-being?
- Consistency with Existing Programs—Does the measure complement or extend existing programs?
- Impact on Chino—What are the advantages and disadvantages of the measure to the community as a whole?
- Speed of Implementation—How quickly can the measure be implemented and when will the City begin to see benefits?
- Implementation Effort—How difficult will it be to develop and implement the program?

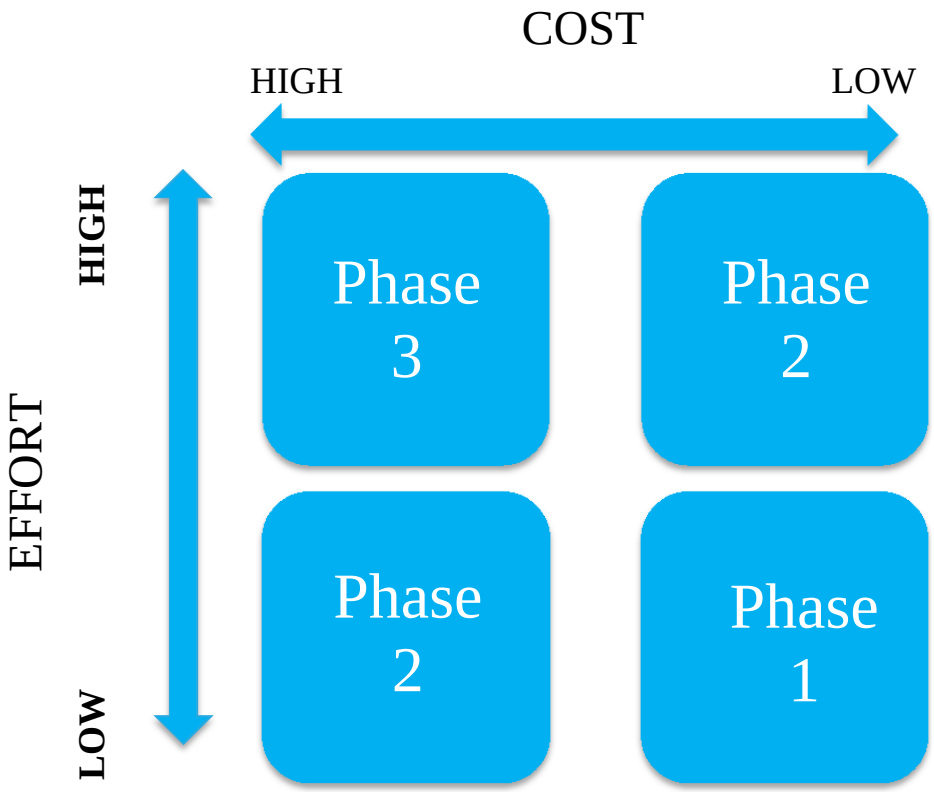
A sample qualitative appraisal of implementation effort for the City is shown in Table 6 below. Measures can be categorized based on the convention of low, medium, or high, with low-level measures requiring the least level of effort by the City and being the most likely to be pursued immediately.

Table 6: Implementation Level of Effort

Implementation Effort Level	Sample Criteria
Low	• Requires limited staff resources to develop • Existing programs in place to support implementation • Required internal and external coordination is limited • Required revisions to policy or code are limited
Medium	• Requires staff resources beyond typical daily level • Policy or code revisions necessary • Internal and external coordination is necessary
High	• Requires extensive staff time and resources • Requires development of completely new policies or programs and potential changes to the general plan • Robust outreach program required to alert residents and businesses of program requirements and eligibility • Requires regional cooperation and securing long term funding

To assist the City in prioritizing, the different GHG reduction measures can be categorized and scheduled based on implementation effort and cost. A sample implementation matrix is shown in Figure 5 below.

Figure 5: Implementation Matrix



Community Outreach

Chino residents and businesses are integral to the success of the CAP and to overall reductions in GHG emissions for the City. Their involvement is essential, considering that several measures depend on the voluntary commitment, creativity, and participation of the community.

The City will educate and encourage stakeholders, such as businesses, business groups, residents, developers, and property owners, about the GHG reduction measures that require their participation. By providing information on the various programs and incentives that are available, the City can increase the participation of these groups in greenhouse gas reductions. The CIT will consider the most appropriate way to facilitate formal community involvement in CAP implementation and adaptation over time. This could include:

- Focused meetings with the development community to evaluate how the measures are being implemented and what the possible constraints are to implementing greenhouse gas reductions.
- Providing periodic written updates in City newsletters, SANBAG's newsletter, on the City website, or through other media communications with the general public such as press releases and public service announcements. Stakeholders will be provided an opportunity to comment on potential improvements or changes to the CAP.

- The CIT could also sponsor periodic outreach events to directly inform and solicit the input, suggestions, and participation of the community at large.

Opportunities to educate the business community about energy efficiency programs available through the City or other agencies will be explored as part of the existing outreach and marketing efforts of the City's Economic Development Division. The City's current business retention and attraction efforts provide several avenues of educating different business sectors about energy efficiency programs available to them. Several business sectors are targeted within these efforts, including: manufacturing, industrial wholesale, warehouse and transportation, retail, office-professional, and commercial real estate development and management. Some examples of the existing programs and opportunities to promote energy efficiency activities include:

- Business Visit Program—Provide information about business assistance resources and programming, and distribute to business owners on scheduled business visits.
- SBDC (Small Business Development Center) Seminar/ Workshop Program—Create a seminar or workshop similar to the current SBDC Small Business Workshop program, highlighting energy efficiency programs and providing the program contact to interested attendees.
- Revise Existing Materials and Information—Incorporate energy efficiency-related information into existing city brochures and web-based materials, such as the Chino Aerial marketing brochure; Shopping Center Vacancy Survey booklet; and For Sale & Lease Vacant Buildings lists.
- Trade Show Attendance—Include energy efficiency information at regional and national retail and industrial trade shows that are attended by the City. This will provide information to current and new businesses within the City, as well as new businesses looking to locate in Chino along with building owners, property management and developer representatives.
- Partnership with Other Business Resource Agencies—Include energy efficiency program information to partnering agencies that the City staff currently works with when serving the small business community. The City partners with the Chino Valley Chamber of Commerce, several government agencies and small business assistance providers, as well as the private sector when conducting retention and attraction efforts. Providing these partnering agencies with information to share with Chino businesses will greatly increase awareness and knowledge of available energy efficiency programs. Business assistance partnering agencies include other levels of government (County, State and Federal), utilities (electric, gas, water), colleges and universities (Chaffey College, UC Riverside), non-profit business assistance agencies (SBDC), and banks.

Climate Action Plan Reporting and Inventory Updates

Regular monitoring is important to ensure programs are functioning as they were originally intended. Early identification of effective strategies and potential issues will enable the City to make informed decisions on future priorities, funding, and scheduling. Moreover, monitoring provides concrete data to document the City's progress in reducing GHG emissions. The CIT will be responsible for developing a protocol for monitoring the effectiveness of emissions reduction programs as well as for undertaking emissions inventory updates. The following describes the primary activities involved in the monitoring of the implementation of the CAP:

1. Update GHG Inventory: The City intends to continue monitoring GHG emissions in collaboration with SANBAG and as funding becomes available. The City will explore a combined inventory effort conducted through SANBAG similar to the inventory preparation that was done for the Regional Plan. The CIT will consolidate information in a database or spreadsheet that can be used to evaluate the effectiveness of individual reduction measures. If feasible at a reasonable cost/effort, annual GHG inventory monitoring may be conducted by the City starting in 2016, but this would not be a commitment of the City until funding mechanisms and resource availability were better understood.
2. Track State Progress: The Chino CAP relies heavily on state-level measures. The CIT will be responsible for tracking the state's progress on implementing state-level programs when it completes inventory updates, usually in conjunction with SANBAG. Close monitoring of the real gains being achieved by state programs will allow the City to adjust its CAP, if needed.
3. Track Completion of GHG Reduction Measures: The CIT will keep track of measures implemented as scheduled in the CAP, including progress reports on each measure, and associated basic cost information. This will allow a rough attribution of gains when combined with regular GHG inventory updates.
4. Regular Progress Reports: The CIT will report every year to the City Council on CAP implementation progress. If such reports or other information indicates that the GHG reduction measures are not as effective as originally anticipated, the CAP may need to be adjusted, amended, or supplemented. The City will conduct a review of CAP effectiveness as part of annual reporting in 2017, which would allow making mid-course adjustments in the CAP if needed to effect change prior to 2020.

Adaptive Management

As CAP implementation progresses over time, some small and large changes may need to be made to keep on track to meet climate reduction goals and choose cost-effective solutions for meeting those goals. Major amendments will require review

by the CIT, Planning Commission and adoption by the City Council. Minor amendments can be accomplished upon review and recommendation by the CIT and approval by the Director of Community Development.

Resources for Implementation

There are substantial opportunities to enhance the effectiveness of the CAP through regional collaboration. The CIT will explore the potential to leverage resources through regional cooperation. Potential opportunities and partners include the following:

1. SANBAG: As the regional council of governments and the regional transportation agency, SANBAG is a logical hub of communication for Partnership cities on the progress of their CAPs. Further, SANBAG will be the responsible implementing agency for many transportation-related measures that result in local GHG reductions. SANBAG is also administering the PACE (property assessed clean energy) program loans and a PPA for energy efficiency and solar energy for participating cities. The PACE program allows homeowners and businesses to finance energy and water efficiency upgrades and pay for them over time through their property tax bills, keeping both the costs and benefits of the program with the structure in case of ownership transfer.
2. Air Districts: The South Coast Air Quality Management District is responsible for developing and implementing air quality plans. It also sponsors various air quality programs that support implementation of energy-efficiency, transportation, and renewable energy measures.
3. Energy Providers: SCE and other local energy providers offer numerous incentives and rebate programs to encourage energy efficiency. Resources offered by the energy providers may reduce the costs of program implementation and administration. There may also be opportunities for cooperation on community-scale alternative energy installations (e.g., wind, solar).
4. Omnitrans and other transportation agencies: Continued coordination with Omnitrans will be necessary to fully implement the transportation reduction measures that promote mixed use development. With SB 375 and its linkage to transportation funding, it is also crucial for the City and transportation agencies to develop a shared vision of how land use and transportation can be consistent with the next RTP and the required SCS.
5. San Bernardino County: The County operates the landfills that receive most of the cities' waste and has committed as part of its own CAP to improve methane control for its landfills which will help reduce emissions associated with City landfilled waste. Coordination with the county to provide the necessary facilities, programs, and incentives would help ensure this goal can be achieved by 2020, as waste services are often shared across several jurisdictions, including the unincorporated portions of the county.

6. Local Water Providers: The City can work with the both the wholesalers and retailers of water to promote reductions in indoor and outdoor water use from existing developments and achieve the goals set forth by SB X7-7, and included in this CAP as Measure Local E-12.
7. Regional and Local Wastewater Agencies. The City can partner with IEUA in promoting reduction of emission associated with wastewater treatment plant operations and to reduce wastewater generations through reduction of stormwater runoff through land use measures promoting infiltration and other non- wastewater treatment plant treatment methods.

Reducing GHG Emissions after 2020

To date, there are no State or federal mandates requiring reduction of GHG emissions after 2020. AB 32 contains no post-2020 reduction target nor provides CARB with the authority to mandate compliance with a post-2020 target. SB 375, while it contains requirements for transportation planning for SCAG to promote reductions in the passenger and light duty vehicle sector, does not contain mandatory requirements for local jurisdictions to reduce their GHG emissions overall.

Beginning in Phase 2 the City expects to work with SANBAG and other partnership cities to commence planning for the post-2020 period. At this point, the City will have implemented the first two phases of the CAP and will have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches. The post-2020 CAP should include a specific target for GHG reductions for at least 2030 and if supported by long-term planning at the state level, should also include preliminary planning for 2040 and 2050. The targets should be consistent with broader state and federal reduction targets and with the scientific understanding of the reductions needed by 2050. While there is no legal requirement yet to conduct future planning post-2020, the City can jump start its efforts by considering implementing the following actions through 2030 to meet the 2050 goal:

- Increase energy efficiency and green building efforts for city municipal buildings as well as private buildings in the region.
- Continue to implement land use and transportation measures to lower VMT and shift travel modes.
- Move beyond 75% local waste diversion.
- Continue to improve local water efficiency and conservation.
- Continue to support and leverage incentive and rebate and other financing programs for residential and commercial energy efficiency and renewable energy installations to shorten payback period and costs and to develop programs that encourage increased use of small-scale renewable power as it becomes more economically feasible.

Appendix A

Acronyms

A1 Acronyms

AB	Assembly Bill
ADA	Americans with Disability Act
ARB	Air Resources Board
AVL	Automatic Vehicle Location
BAPIS	Bus Arrival Prediction Information System
BAU	Business As Usual
CAFÉ	Corporate Average Fuel Economy
Cal-EPA	California Environmental Protection Agency
CAP	Climate Action Plan
CARB	California Air Resources Board
CCA	Community Choice Aggregations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
CIT	CAP Implementation Team
CO_2	carbon dixoide
CPUC	California Public Utilities Commission
EPA	U.S. Environmental Protection Agency
EO	Executive Order
ESP	energy service providers
EVSE	electric vehicle supply equipment
GHG	greenhouse gas
GTFS	General Transit Feed Specification
GVI	Green Valley Initiative
HERS	Home Energy Rating System
HFC	Hydrofluorocarbons
IEUA	Inland Empire Utilities Agency

IOU	investor-owned utilities
IVR	Interactive Voice Response
LCFS	Low Carbon Fuel Standard
LED	light emitting diode
$MTCO_2e$	metric tons of carbon dioxide equivalent
N_2O	nitrous oxide
ODS	ozone-depleting substances
PACE	Property Assessed Clean Energy
PFC	Perfluorinated Carbons
PPAs	Power Purchase Agreements
QR	Quick Response
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
SANBAG	San Bernardino Associated Governments
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SF_6	Sulfur Hexafluoride
TDM	Transportation Demand Management
VMT	Vehicle Miles Traveled
WWTP	Waste Water Treatment Plant

Appendix B

Relevant General Plan Policies

Contents

B1 Relevant General Plan Policies 1

B1 Relevant General Plan Policies

Element	Goal	Objective	Policy / Action	Text
LU	**LU-1**			**Enhance the livability of Chino neighborhoods.**
		1.2		**Create and maintain neighborhoods that facilitate walking, bicycling, and transit use in lieu of car travel.**
			P1	Neighborhoods should be designed such that all residences are within a quarter-mile walk of transit stops and recreational areas, and within a half-mile walk of daily retail needs.
			P2	The City shall encourage the development of complementary land uses not already present in residential neighborhoods, such as grocery stores, basic commercial services, parks and recreational fields, and schools.
	LU-3			**Revitalize older commercial and industrial areas in the center of Chino.**
		3.1		**Encourage development as shown in the Focused Growth Plan, which implements the Focused Growth Vision.**
			P2	As described in Section E of this Element, City staff shall support and expedite General Plan and/or Specific Plan Amendments, Zone Change and development applications to the greatest extent possible for projects that are proposed by owners and consistent with the Focused Growth Plan designation on the associated parcel or parcels.
			P3	Development projects using Focused Growth Plan land use designations shall be designed to support the use of public transportation, including orienting entrances where possible to face the public right-of-way rather than rear parking areas, pedestrian-oriented facades, and signage, where appropriate, indicating the locations of nearby transit stops.
			P4	The City shall waive General Plan and/or Specific Plan Amendment and Zone Change application fees for those projects that are consistent with the Focused Growth Plan.
			P5	Where applicable, the City shall use the infill streamlining provisions found in section 21094.5 of the California Environmental Quality Act, to streamline environmental review of infill development on parcels with a Focused Growth designation.

Element	Goal	Objective	Policy / Action	Text
LU			P6	The City shall be proactive in encouraging development on parcels with a Focused Growth designation, including contacting property owners, local brokers, and others in the development community to ensure they are aware of the Measure M process and potential benefits of participating in that process.
			P7	The City shall prioritize infrastructure expenditures to support Focused Growth development, such as streetscape and right-of-way improvements, sewer and water infrastructure and bicycle facility expansions.
			A4	Develop a Focused Growth Plan zoning overlay district, considering approaches such as providing reduced minimum parking requirements; expanding the flexibility of the Zoning Code's general parking provisions with respect to shared and off-site parking; increased maximum heights, numbers of stories, and floor area ratio; streamlined permit processing procedures; and expanded flexibility in setbacks for parcels with a Focused Growth designation. The overlay shall be designed in a manner that maintains the character of the surrounding neighborhood, and that meets the purpose set out in the Zoning Code for the applicable zoning district. The provisions in the overlay shall become effective immediately upon passage of a Measure M vote for such parcels.
			A5	Apply the Focused Growth Plan zoning overlay district to parcels with Focused Growth designations, identifying the approaches and opportunities that will help to facilitate infill development on those parcels.
	LU-5			**Reduce Chino's greenhouse gas emissions.**
		5.1		**Promote efficient, compact land use patterns to prevent sprawl and reduce automobile use.**
			P1	The City shall facilitate infill development through active leadership and the strategic provision of infrastructure, services, and supporting land uses.
			P2	The City shall encourage mixed-use, infill development on brownfields, near public transit, and on underutilized properties within the urban core.
			P3	The City shall discourage strip commercial development.
			P4	The City shall strive to balance commercial and residential development within the City to reduce the number of residents commuting long distances to work.

Element	Goal	Objective	Policy / Action	Text
LU			P5	The City shall support development at the maximum density allowed by this General Plan along Central Avenue, Riverside Drive, and Euclid Avenue, as a means to increase the number of residents with access to transit lines along those roadways.
			P6	Affordable housing shall be located in transit-oriented developments whenever feasible.
		5.2		**Review fee structures to provide financial and administrative incentives to support desired land uses and development patterns, and alternative modes of transportation.**
			P1	The City shall give preference to infrastructure improvements that support or enhance desired land uses and projects.
			A1	Develop a program to provide incentives for projects that support smart growth goals and reduce greenhouse gases, such as mixed-use, infill, and transit-oriented development projects.
	LU-7			**Locate new development to create a consolidated pattern of urbanization, maximizing the use of existing services and facilities.**
		7.1		**Encourage new development at a rate that can be served by available and planned public infrastructure.**
			P3	Urban development shall occur only where the City can determine that urban public facilities and services exist or can be reasonably made available.
TRA	**TRA-1**			**A roadway system that meets the needs of Chino's residents and visitors, provides safe, convenient, and efficient travel in, around, and through the City, and preserves and/or enhances the City's distinctive qualities.**
		1.1		**Develop and maintain a street network that meets Chino's needs and responds to new development.**
			A2	Conduct a study of the standard cross-sections used for roadways to determine whether there are appropriate locations in the City for narrower auto travel lanes, reduced median widths, expanded bicycle and pedestrian facilities, and/or reduced on-street parking requirements; this study should also consider situations where there is not sufficient right-of-way to build or widen a street consistent with the standard section, and should consider the relationship of the roadway to adjacent properties to ensure compatibility to the greatest extent possible.

Element	Goal	Objective	Policy / Action	Text
TRA		**1.2**		**Adopt and enforce level of service standards that provide safe and efficient transportation for Chino's residents and workers.**
			P1	The City shall achieve an average LOS D or better at intersections and along roadway segments while also prioritizing pedestrian safety near schools, parks, and other public destinations. This average shall be demonstrated to the satisfaction of the Director of Public Works.
			P2	The City should prioritize pedestrian safety and recognize that it may not meet its goal of achieving an LOS D in all locations, particularly in proximity to schools, parks, and other public destinations.
	TRA-4			**Maximize the efficiency of the existing transportation network throughout Chino with the use of Intelligent Transportation Systems (ITS) strategies.**
	TRA-5			**Facilitate safe, active and comfortable commutes to and from school for Chino's school children.**
		5.1		**Increase the proportion of Chino school children who walk, bicycle, use public transportation and carpool to and from school.**
TRA	**TRA-6**			**Improve the convenience, intuitiveness, and safety of Chino's street network.**
		6.1		**Foster connectivity in the Chino street system.**
			P4	Street networks in new neighborhoods shall be configured in a manner that helps to promote mobility by vehicles, transit, bicycles, and pedestrians, while maintaining access to adjacent neighborhoods by all such modes of transportation.
		6.2		**Reduce the incidence of traffic collisions, personal injuries, property damage and casualties among users of Chino's transportation system.**
			A1	Periodically review policies, actions, and regulations to ensure that the City is employing up-to-date techniques for providing Complete Streets that accommodate all travel modes, ages, and abilities.
			A2	Study individual accident locations, especially "hot spots" with multiple accidents, and identify necessary upgrades to reduce the incidence of accidents.

Element	Goal	Objective	Policy / Action	Text
TRA	**TRA-7**			**Minimize the share of travel for single occupancy vehicles in Chino.**
		7.1		**Develop and implement Transportation Demand Management (TDM) programs in Chino.**
			P1	City shall encourage employers of 100 or more full-time employees, as well as schools and other organizations, to develop TDM plans to increase carpooling, and encourage the use of public transportation, bicycling, and walking.
			P2	The City shall encourage employers of 100 or more full-time employees to allow telecommuting (work at home) and flexible and alternate work schedules to allow commuters to increase their use of alternative forms of transportation, and to minimize congestion at peak hours.
			P3	The City shall encourage employers with 100 or more fulltime employees and major retailers to provide shuttle service from local and transit intermodal facilities to the place of employment or shopping center.
			P5	The City shall encourage employers to pay for transit passes for their employees who agree not to drive to work, to implement flexible work schedules, and to provide bike racks/storage and lockers/showers for bicycle and walking commuters.
			P6	The City shall encourage new industrial and commercial developments, the Chamber of Commerce, the school district, and large employers to distribute promotional material concerning transit ridership opportunities and services.
TRA	**TRA-9**			**Foster public transit as an enjoyable, reliable, safe, convenient, equitable, healthy, environmentally-friendly and economical travel choice in Chino.**
		9.1		**Increase the accessibility of public transit stops for all Chino residents and workers.**
			P1	The City shall encourage and promote the development of passenger rail service to the Chino Transit Center. This rail service should connect Chino residents and workers to other Metrolink stations.
			P2	The City shall encourage the routing of buses to the Chino Airport, Chaffey College, and other major destinations to facilitate transit access for workers, students, and airport passengers.

Element	Goal	Objective	Policy / Action	Text
TRA			P3	To the extent feasible, transit stops shall have dedicated curbside loading space, passenger shelters and amenities such as maps and schedules (or real-time arrival information).
			P4	New developments shall provide for transit and bicycle facilities such as bus stops, bus bays, transit shelters, benches, onsite drop off locations, bicycle racks, lockers and showers.
			P5	The City shall recommend to transit providers increases in transit service to areas targeted for redevelopment or concentrations of transit-oriented development.
			P6	The City shall work with transit providers to increase access to transit stops, including prioritizing City street infrastructure improvements in locations that support pedestrian and bicycle access to transit stops, as well as the Chino Transit Center.
		9.2		**Increase the attractiveness and convenience of public transportation choices in Chino.**
			P2	The City shall work with transit providers, including Omnitrans, to identify opportunities to increase funding for public transportation vehicles, equipment, and service provision in Chino. This could include collaborating on funding applications to regional, State, or federal agencies, as well as supporting providers in identifying new local sources.
			P3	The City shall work with local transit agencies to evaluate and implement where possible electronic payment systems, coordinated schedules, and other measures that improve the ease of ridership for passengers.
			A3	Study, together with local transit agencies, opportunities for transit-preference, such as signal priority and timing on transit routes to increase the speed and reliability of service; consider other measures that improve the efficiency and attractiveness of the service.
			A4	Study demand along major public transit routes to determine demand in key years through 2030 and collaborate with local transit agencies to use the information to prioritize transit funding expenditures.

Element	Goal	Objective	Policy / Action	Text
TRA	**TRA-10**			**Foster bicycling as a convenient, healthy and environmentally-friendly travel choice in Chino.**
		10.1		**Increase the use of bicycle travel within Chino.**
			P1	Libraries, schools, community centers, and other important community facilities in Chino shall have bicycle parking, including racks and lockers as appropriate.
			P2	The City shall require new development to provide off-street bicycle parking per zoning standards, and shall review those standards periodically to ensure that adequate bicycle parking is being provided.
			P3	The City shall encourage employers of 100 or more full-time equivalent employees to provide showers and lockers for bicycle commuters.
			P4	Incorporate bicycle paths/trails/facilities outside the street right-of-way in all new development, consistent with the Bicycle Master Plan.
		10.2		**Increase the connectivity, safety and convenience of the bicycle network.**
			P1	The City shall enhance and improve bicycle connections between neighborhoods, and between neighborhoods and significant destinations such as parks, schools, transit stops and transit centers, shopping centers, and employment centers.
	TRA-11			**Enhance the convenience, intuitiveness, and safety of Chino's pedestrian network.**
		11.1		**Increase the pedestrian share of travel within Chino.**
	TRA-14			**Reduce greenhouse gas emissions by reducing vehicle miles traveled and by increasing or encouraging the use of alternative fuels and transportation technologies.**
		14.1		**Review available transportation funding to encourage a shift from single-occupancy vehicles to transit and other modes of transportation.**
			P1	The City shall work with transit agencies to prioritize funding for expanded transit service and transit service with lower emissions.
		14.2		**Promote the use of low- and zero emission vehicles, and alternative fuels, and other measures that directly reduce emissions from motor vehicles.**

Element	Goal	Objective	Policy / Action	Text
PFS	**PFS-7**			**Ensure an adequate supply of water for all types of users.**
		7.1		**Ensure that reliable water supply can be provided within the City's service area, even during drought conditions, while protecting the natural environment.**
			P1	The City shall continue to acquire additional supplies of water, including local groundwater and recycling, to meet future demands.
			P2	The City shall establish water demand reduction standards for new development and redevelopment to reduce per capita and total demand for water.
			P3	The City shall review proposed irrigation systems to ensure they provide required water efficiency.
			P4	The City shall review proposed new development and significant redevelopment to determine whether all feasible water conservation measures are being implemented. Possible measures include drought tolerant landscaping, efficient irrigation systems, and rain barrels. In conducting this review, the City shall consult State-wide resources governing water-efficient landscaping.
			P5	City shall implement cost-effective water conservation programs that improve water-use efficiency, reduce water demand, and preserve the City's supplies.
			P6	The City shall coordinate with neighboring water agencies to implement regional water conservation programs as part of its water resource management strategy.
		7.2		**Provide adequate water infrastructure facilities to meet current and future populations.**
		7.3		**Promote coordination between land use planning and water facilities and service.**
			P4	The City shall consider the availability of sufficient, reliable water when reviewing new development.

Element	Goal	Objective	Policy / Action	Text
PFS		**7.5**		**Use recycled water to offset potable water demands whenever practicable and feasible.**
			P1	The City shall review new development projects to determine and which are appropriate for recycled water piping systems ("purple pipe"). The City shall require these projects to incorporate such systems to facilitate the distribution and use of recycled water. In most cases, appropriate projects will be public facilities, industrial users, agricultural users, street medians, parkways, and parks. However, the City may identify large water consumption residential users as having potential for recycled water in cases where appropriate infrastructure exists and the residential users have extensive landscaping needs.
			P2	To the extent feasible, the City and development projects with purple pipe in place shall use recycled water for all nonpotable uses, such as landscape irrigation, dust control, industrial uses, cooling water, and irrigation of agricultural lands. This can include indoor as well as outdoor uses in an industrial setting.
			P3	As appropriate, the City shall require all businesses and industries to use recycled water for irrigation.
			P4	The City shall condition new industrial/commercial and residential developers to construct recycled water backbone facilities for their development.
			P5	The City shall provide recycled water piping systems to all new parks and schools.
	PFS-12			**Reduce overall generation of solid waste in safe, sanitary, and environmentally acceptable ways.**
		12.1		**Reduce volumes of solid waste generated in Chino through collection, storage, transportation, recycling, and disposal.**
			P1	The City shall require mandatory trash, recycling, and greenwaste pick-up as a means to ensure a safe, sanitary environment

Element	Goal	Objective	Policy / Action	Text
PFS			P3	The City shall strive to meet or exceed the State's goal of diverting 50 percent of all solid waste from landfills.
			P4	The City shall promote the redesign, reuse, composting, and shared producer responsibility of discarded material.
			P5	The City shall encourage local businesses to expand their recycling and composting efforts and to reduce packaging of products manufactured in the City.
			P6	The City shall encourage the use of post-consumer recycled paper and other recycled materials in all City operations.
OSC	**OSC-4**			**Minimize the consumption of energy and nonrenewable resources, and promote environmental sustainability.**
		4.1		**Incorporate green building practices throughout the City.**
		4.2		**Promote the conservation and efficient use of energy resources throughout the City.**
	OSC-5			**Reduce greenhouse gas emissions by 15 percent below 2008 levels by 2020.**
		5.1		**Take appropriate actions to reduce greenhouse gas emissions and Chino's contribution to global climate change.**
			P1	The City shall promote strategic land use patterns, a diverse and efficient public transportation system, and other measures that reduce the number and length of motor vehicle trips.
			P2	The City shall seek to reduce greenhouse gas emissions associated with City operations, using measurements of its greenhouse gas emissions to quantify and improve the effectiveness of these efforts.
			P3	The City shall work with homeowners and business owners to support their efforts to reduce greenhouse gas emissions.

Element	Goal	Objective	Policy / Action	Text
OSC			A2	Review fee structures and identify opportunities to provide financial and administrative incentives to support land uses and development patterns that reduce the number and length of motor vehicle trips.
			A4	The City shall continue to implement and revise as needed the existing schedule for city-wide energy efficiency project activities for tune-ups and upgrades of aging municipal buildings, equipment, and vehicles, as well as continue to identify potential funding sources that may include Department of Energy grants, budgeted funds for the City's Capital Improvements Program, or other sources determined appropriate by the City.
			A5	Inventory greenhouse gas emissions associated with City operations and identify specific approaches to reduce emissions associated with such operations. The City will consider using energy efficiency measures such as lighting, heating, cooling, roofing, and insulation and on-site renewable energy to offset City energy use. It will also consider other approaches to reducing emissions associated with its operations such as water-efficiency measures, recycling, and other waste-reduction measures, and measures to reduce solo-driver employee commutes.
			A6	Explore additional options, beyond those already found in the Climate Action Plan, for requiring greenhouse gas-reducing retrofits on existing sources of greenhouse gas emissions when discretionary actions subject to the California Environmental Quality Act are reviewed by the City.
	OSC-6			**Prepare Chino for the expected impacts of global climate change.**
		6.1		**Implement measures to mitigate expected temperature increases.**
			P1	The City shall mitigate climate change by decreasing heat gain from pavement and other hard surfaces associated with infrastructure.
			P2	The City shall actively inspect non-residential buildings and enforce State requirements for cool roofs on non-residential re-roofing projects.
			A1	Develop a program to prepare for extreme heat events, including outreach and notification focused on sensitive populations and the establishment of new and maintenance of existing cooling centers.
			A2	Consider preparation of a Heat Island Mitigation Plan that requires cool roofs, cool pavements, and strategically placed shade trees.

Element	Goal	Objective	Policy / Action	Text
CC	**CC-3**			**Create livable neighborhoods that feature pedestrian-orientation, mixed uses, and a sense of place.**
		3.1		**Establish a focal point in every neighborhood.**
			P3	Focal points should be within ¼-mile walking distance of any point in the neighborhood.
	CC-4			**Design new and existing neighborhoods to be pedestrian friendly.**
		4.1		**Design neighborhoods to emphasize connectivity as a means of increasing pedestrian activity.**
			P3	Streets in neighborhoods shall be designed to enhance the sense of place and create a safe and comfortable pedestrian environment
			P4	Residential block lengths should be short, typically no more than 400 feet, to create a street pattern that allows for multiple routes through a neighborhood and greater opportunities for pedestrian activity.
		4.2		**Connect established and new areas of the City with one another.**
		4.3		**Design buildings and sites to enhance the pedestrian environment.**
CC			P9	Direct and safe pedestrian connections between parking lots and buildings shall be provided, through the use of decorative paving, bollards, landscaping, lighting, or other distinctive features.
		4.4		**Ensure roadways include appropriate trees and landscaping that are safe, improve air quality, and provide a more pleasant environment for drivers, cyclists, and pedestrians.**
			P1	The City shall require all 6- to 8-lane arterial road medians to provide a 5- to 6-foot-wide tree buffer (parkway) between pedestrians and through traffic.

Element	Goal	Objective	Policy / Action	Text
AQ	**AQ-1**			**Preserve and improve air quality in Chino and the region.**
		1.1		**Improve air quality through land use and transportation planning decisions.**
			P1	The City shall promote land use patterns that reduce the number and length of motor vehicle trips.
			P2	Where development opportunities near shopping areas and transit corridors exist, the City shall prioritize higher-density residential development.
			P4	Design new intersections to function in a manner that reduces air pollutant emissions from stop and start and idling traffic conditions.
			P7	The City shall promote expansion of employment opportunities within Chino to reduce commuting to areas outside of the City
			P8	The City shall continue to enforce the vehicle idling restrictions established by the State.
			A1	Implement traffic features such as roundabouts or the use of integrated signalization to improve traffic flow and reduce emissions from vehicle idling and stop and start.
			A2	Install LED traffic signals throughout Chino to reduce the City's electricity consumption.
			A3	Utilize the latest energy-efficient technologies for street and parking lot lights that meet City and state standards.
AQ			A4	Establish a local ordinance that exceeds the State vehicle idling restrictions where appropriate, including restrictions for bus layovers, delivery vehicles, trucks at warehouses and distribution facilities, and taxis, particularly when these activities take place close to sensitive land uses (schools, senior centers, medical facilities, and residences).
		1.2		**Support local and regional air quality improvement efforts.**
			A1	Establish a local ordinance to prohibit solid fuel wood-burning devices in mixed-use high-density development and restrict the installation of wood-burning appliances in new or redeveloped single-family residential properties to those that burn pellets, natural gas, or propane, or at a minimum, EPA-certified wood burning units.
		1.3		**Reduce air pollution during construction and operations of a project.**

Appendix C

Greenhouse Gas Emissions Inventory Methods*

*Source: Appendix A, Section 5 of the San Bernardino County Regional Greenhouse Gas Reduction Plan, September 2012.

Section 5
Methods

This section presents the overall methods used to prepare the 2008 community GHG emissions inventories. This section discusses the inventory definitions, inventory protocols used, emissions factors, and analysis methods.

5.1 Inventory Definitions

Community Inventory. The community inventory includes GHG emissions occurring within a city's geographic or jurisdictional boundaries or as a result activity within those boundaries, and includes emissions most readily under the control or subject to the influence of that city. The boundaries of the community inventory are "geographical" such that the emissions included, or activities associated with emissions, must occur inside the jurisdictional boundary of the city, as long as the emissions source is subject to the city's jurisdiction. For direct emissions (such as natural gas combustion in buildings), if a city can have a substantial effect on those emissions by influencing energy use (such as through green building codes), then the direct emissions are included in the inventory. For indirect emissions (such as solid waste disposed outside of the county), if the city can have a substantial effect on those indirect emissions by influencing demand (such as waste minimization and diversion programs), then they are included in the inventory. By including emissions that are controlled by or subject to the influence of the cities, the inventory can form the basis for local climate action planning. The year 2008 was chosen for the current community inventories because it was the most recent year with the necessary data to perform a comprehensive inventory, and it was a year for which transportation emissions could be compared to regional SCAG study base years for the next Regional Transportation Plan. The inventory includes any measures or programs (such as those designed to reduce GHG emissions) implemented prior to the base year.

Municipal Inventory. The municipal inventory includes GHG emissions associated with the city's services and municipal operations. Municipal inventories are not calculated or presented in this report, but have been developed or will be developed by individual cities on their own.

Some emissions sources are included in both inventories, as there are overlaps in the operational boundaries of the community and municipal inventories. For example, in the community inventory, light/medium-duty vehicle emissions include emissions from all passenger vehicles traveling in each city. The corresponding municipal inventory category is vehicle fleet emissions, which operate mostly in each city, but may also operate outside of individual city boundaries. The overlap between the community and municipal inventories for the transportation sector would be those city vehicle emissions that occur in each city because these emissions are accounted for in the transportation modeling for that city. Emissions from city-operated vehicles traveling outside each city's boundaries would be included in the municipal inventory but only partially in the community inventory for that same city because they would be split with other jurisdictions in their community inventories.

BAU 2020 Forecast. The 2020 emissions forecast represents BAU emissions associated with each city's community emissions in 2020. This forecast accounts for any active programs (such as those

designed to reduce emissions) that were already in place in 2008 (since these programs would have affected the 2008 baseline inventory). The 2020 BAU forecast does not account for any programs implemented after 2008, or changes to programs that occurred after 2008.

Unit of Measure: The unit of measure used throughout this GHG inventory is the metric ton of CO_2 equivalent ($MTCO_2e$). This is the international unit that combines the differing impacts of all greenhouse gases into a single unit, by multiplying each emitted gas by its GWP. GWP is the measure of how much a given mass of GHG contributes to global warming. GWP compares the relative warming effect of the GHG in question to CO_2.[1]

Emissions Type: GHG emissions can be defined as either *direct* (emissions that occur at the end use location such as natural gas combustion for building heating) or *indirect* (emissions that result from consumption at the end use location but occur at another location such as emissions from electricity). This report addresses both types of emissions. In addition, all references to *emissions* are equivalent to *GHG emissions.*

5.2 2020 Business-as-Usual Forecast

A BAU projection was developed for the year 2020 (2020 BAU forecast). This projection estimates the level of emissions resulting from each city in 2020. Because it does not account for any programs that would reduce emissions and are implemented after the inventory base year (2008), this projection reflects the impacts of city growth. The projection does, however, account for the prior impact of any programs that were implemented prior to 2008, as these programs have already lowered the baseline year emissions. Any measures or programs implemented prior to 2008 are accounted for in the 2008 inventory.

As such, the projection can be used to determine the magnitude of the reductions that need to be achieved by 2020 (relative to current emissions) to achieve each city's emissions-reduction target. The BAU projections are based on current energy consumption and anticipated growth rates provided by the cities, SCAG, CARB, and other appropriate data sources, as listed in this report. Consistent with California's BAU projections, the 2020 BAU emissions projection does not assume the implementation of any federal, state, or local reduction measures but projects the future emissions based on current energy and carbon intensity in the existing economy. The specific assumptions associated with the energy growth rates are provided in Section 5.5, "Analysis Methods."

As the population and workforce in each city grow, emissions will increase over time. Total 21-city region emissions (for the inventoried cities) are projected to increase by approximately 18% from 2008 to 2020. The increase from 2008 to 2020 will occur primarily in the building energy use and stationary source sectors, as they are primarily tied to growing population and employment. Agriculture emissions will decrease over time as the activity occurring at the dairies in Chino and

[1] The GWP of CO_2 is, by definition, one (1). The GWP values used in this report are based on the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR) and United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines and are as follows: CO_2 = 1, CH_4 = 21, N_2O = 310, SF_6 = 23,600 (Intergovernmental Panel on Climate Change 1996; United Nations Framework Convention on Climate Change 2006). Although the IPCC Fourth Assessment Report (AR4) presents different GWP estimates, the current inventory standard relies on SAR GWPs to comply with reporting standards and consistency with regional and national inventories (EPA 2010b).

Ontario is anticipated to decline. Population, employment, and housing projections were provided by SCAG. Additional growth data were collected from other sources, as detailed below and in Appendix A.

The methods and assumptions for the projections discussed in the following sections are intended to produce a reasonable estimate of emissions for 2020. Although these assumptions are supported by established inventory protocols and widely used inventory methodologies, the methods for estimating 2020 BAU forecast emissions for the 21-city region is subject to certain limitations. Specifically, in cases where future emission factor data are limited, the emission factors were assumed to remain constant from the current year's inventory. In addition, emissions were estimated based on historical and projected trends in associated emissions-generating activities. However, it is possible that future emissions may not actually follow these trends.

5.3 Inventory Protocols

Numerous widely accepted protocols for estimating GHG emissions were used to prepare the community and municipal inventory. The protocols used in the development of this inventory include those following (listed in order of applicability for the inventory):

- ICLEI U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI–Local Governments for Sustainability USA 2012). This protocol establishes a number of requirements for reporting community GHG emissions. The protocol requires inclusion of five basic emissions generating activities: use of purchased electricity, use of fuel in stationary applications, use of on-road motor vehicles, water consumption, and solid waste disposal. The protocol also recommends (but does not require) inclusion of other emissions sectors over which a jurisdiction has control or substantial influence. This inventory includes all the five basic emissions generating activities, as well as additional emission sectors under the control of cities in San Bernardino County (such as wastewater treatment and agricultural activity).
- CARB LGOP (2010). This protocol is the standard for estimating emissions resulting from government buildings and facilities, government fleet vehicles, wastewater treatment and potable water treatment facilities, landfill and composting facilities, and other operations.
- California Climate Action Registry and General Reporting Protocol (2009). This protocol provides guidance for preparing GHG inventories in California.
- CARB California Greenhouse Gas Inventory Data 1990–2006 (2010a). CARB's documentation provides background methods, activity data, protocols, and calculations used for California's statewide inventory.
- CEC Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 (2006b). This inventory provides useful methods and emission factors for statewide GHG emissions inventorying.
- EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2008 (2010a). This inventory provides useful methods and emission factors for nationwide GHG emissions inventorying.
- Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (2006). This document is the international standard for inventories and provides much of the baseline methods used in the national and statewide emissions inventories.

Direct and indirect emissions were quantified and included in the community inventories. For example, direct emissions associated with on-site natural gas use are included because these emissions occur within each city and are subject to each respective city's influence or control. Indirect GHG emissions associated with electricity use are included because these emissions can occur outside of each city but are subject each respective city's influence or control.

5.4 Emission Factors

Emission factors and references are summarized in Table 5-1. These emission factors were used to calculate GHG emissions from activity data, such as kilowatt-hour (kWh) of electricity consumed for lighting or gallons of gasoline fuel combusted for on-road transportation.

Table 5-1. Greenhouse Gas Emission Factors

Source	Emission Factor	Reference
Energy and Stationary Fuels		
Electricity	0.28617 kg CO_2/kWh[a]	CCAR 2010 (2007 data)
	0.94032 kg CO_2e/kWh[b]	Lincus Inc. 2012 (2011 data); CARB 2012
	0.309 kg CO_2/kWh[c]	EPA 2010b (2007 data)
	0.56817 kg CO_2/kWh[d]	EPA 2010b (2007 data)
	0.000013 kg CH_4/kWh[e]	EPA 2010b (2007 data)
	0.000009 kg CH_4/kWh[f]	EPA 2010b (2007 data)
	0.000003 kg N_2O/kWh[e]	EPA 2010b (2007 data)
	0.000008 kg N_2O/kWh[f]	EPA 2010b (2007 data)
	0.000129 g SF_6/kWh	CARB 2010a
Natural Gas	53.3 kg CO_2/GJ	IPCC 2006
	0.005 kg CH_4/GJ	IPCC 2006
	0.0001 kg N_2O/GJ	IPCC 2006
Vehicle Fuels		
Diesel	10.15 kg CO_2/US Gallon	CCAR 2009
	0.00015 kg CH_4/US Gallon	IPCC 2006
	0.00015 kg N_2O/US Gallon	IPCC 2006
Gasoline	8.78 kg CO_2/US Gallon	CCAR 2009
	0.00013 kg CH_4/US Gallon	IPCC 2006
	0.0002 kg N_2O/US Gallon	IPCC 2006
Propane	5.79 kg CO_2/US Gallon	CCAR 2009
	0.000992 kg CH_4/US Gallon	CCAR 2009 and NAFA 2010
	0.002631 kg N_2O/US Gallon	CCAR 2009 and NAFA 2010
CNG	1.906992 kg CO_2/m3	IPCC 2006
	0.011127 kg CH_4/m3	IPCC 2006
	0.00099kg N_2O/m3	IPCC 2006
Water-Related Electricity Intensities for Southern California		
Water supply and	9,727 kWh/MG	CEC 2006a

Source	Emission Factor	Reference
conveyance		
Water Treatment	111 kWh/MG	CEC 2006a
Water Distribution	1,272 kWh/MG	CEC 2006a
Wastewater Treatment	1,911 kWh/MG	CEC 2006a
SF_6 from Electricity Consumption	0.000129 g SF_6/kWh	CARB 2010b

[a] Emission factor applies to electricity delivered to Southern California Edison (SCE) customers.
[b] Emission factor applies to electricity delivered to the City of Colton (Colton Public Utilities).
[c] Emission factor applies to electricity delivered to the City of Big Bear (emission factor for the CAMX eGRID region).
[d] Emission factor applies to electricity delivered to the City of Needles (emission factor for the AZNM eGRID region).
[e] Emission factor applies to electricity delivered to all cities except Needles (emission factor for the CAMX eGRID region).
[e] Emission factor applies to electricity delivered to the City of Needles (emission factor for the AZNM eGRID region).
CO_2 = carbon dioxide; CH_4 = methane; IPCC = Intergovernmental Panel on Climate Control; KWh/MG = kilowatt hour per million gallons; CARB = California Air Resources Board; EPA = U.S. Environmental Protection Agency; kg = kilogram; N_20 = nitrous oxide. CCAR = California Climate Action Registry; NAFA = National Association of Fleet Administrators; SF_6 = sulfur hexafluoride; CNG = compressed natural gas.

5.5 Analysis Methods

As defined above, the community inventories include GHG emissions occurring within the boundaries of each city in the 21-city region. The following emissions sectors are included in the community inventories. The data source for each emission sector also is listed.

- **Residential:** natural gas (direct emissions) and electricity consumption (indirect emissions) for the residential sector. Data provided by utilities.
- **Commercial / Industrial:** natural gas (direct emissions) and electricity consumption (indirect emissions) for the commercial and industrial sectors. Data provided by utilities.
- **Stationary Sources:** cement plants, fuel combustion, industrial process emissions etc. Data provided by SCAQMD countywide inventory and by CARB.
- **Light/Medium-Duty Vehicles:** fuel consumption for light-duty and medium-duty passenger vehicles traveling in each city.
- **Heavy-Duty Vehicles:** fuel consumption for heavy-duty trucks traveling in each city.
- **Off-Road Equipment:** fuel consumption for off-road vehicles and equipment in each city. Data provided by the OFFROAD model.
- **Agriculture:** enteric fermentation, manure management, and fertilizer application from dairy operations. Data provided by the California Department of Food and Agriculture's Production Statistics and other sources provided by San Bernardino County.

- **Solid Waste Management:** CH_4 emissions from waste generated by each city and deposited in landfills. Data provided by CalRecycle.
- **Wastewater Treatment:** fugitive emissions from domestic wastewater treatment. Data provided by CARB.
- **Water Transport, Distribution, and Treatment:** electricity consumption associated with water importation. Data provided by the CEC.
- **SF_6 from Electricity Consumption:** fugitive emissions of SF_6 from the transport of electricity to the city. Data provided by utilities and CARB.

The inventory was conducted primarily using ICF's proprietary Greenhouse Gas Inventory Database (GHG:ID) tool and supplemented with additional emissions calculations. This tool is designed to help clients develop a transparent GHG inventory that conforms to widely accepted protocols and provides information required to form corporate GHG strategy. For San Bernardino Regional emissions, the tool was modified to include solid waste management emissions, wastewater treatment emissions, and water conveyance emissions.

Table 5-2 presents the emissions sectors included in the community inventory, the data source for each emission sector, the methods for scaling 21-city regional emissions to each city where appropriate, and the methods for projecting emissions to 2020. Population, housing, and employment estimates and forecasts for 2008 and 2020 are presented in Table 5-3. These projections were used to forecast emissions in 2020.

Table 5-2. Community Inventory Data Sources and Methods

Sector	Emission Sources	Source of Data	Scaling Methods	Projection Methods
Residential	Electricity consumption Natural gas consumption Other fuel consumption by type (natural gas, LPG, fuel oil, diesel, gasoline, etc.)	Electricity records from utilities (city-level data)[b] Gas records from utilities (city-level data)[c]	None	Growth in households
Commercial	Electricity consumption Natural gas consumption Other fuel consumption by type (natural gas, LPG, fuel oil, diesel, gasoline, etc.)	Electricity records from utilities (city-level data)[b] Gas records from utilities (city-level data)[c]	None	Growth in employment
Industrial	Electricity consumption Natural gas consumption Other fuel consumption by	Electricity records from utilities (city-level data)[b] Gas records from utilities (city-level data)[c]	None	Growth in employment

Sector	Emission Sources	Source of Data	Scaling Methods	Projection Methods
	type (natural gas, digester gas, LPG, fuel oil, landfill gas and diesel)			
Stationary Sources	Cement plant process emissions Fuel combustion Industrial process emissions	SCAQMD (countywide data)	City population and employment[a]	Population and employment growth factors
Light/Medium-Duty Vehicles	Light and medium-duty passenger vehicle fuel combustion	SCAG's regional travel demand model	VMT accounting methods recommended by Regional Targets Advisory Committee	SCAG's regional travel demand model uses socioeconomic growth forecasts.
Heavy-Duty Vehicles	Heavy-duty truck fuel combustion	SCAG's regional travel demand model	VMT accounting methods recommended by Regional Targets Advisory Committee	SCAG's regional travel demand model uses socioeconomic growth forecasts.
Off-road Equipment	Off-road vehicles and equipment fuel combustion	OFFROAD2008	Population and employment	Population and employment growth forecasts[d]
Agricultural Emissions	Enteric fermentation and manure management from dairy and other agricultural operations, fertilizer application from farm operations	Department of Food and Agriculture's Production Statistics (county-level data) Regional Water Quality Control Board livestock counts (city-level data) Department of Conservation, Division of Land Resource Protection Farmland Mapping and Monitoring Program (county-level data)	Quantity of dairy, cattle, and swine; grazing land use	Linear projection of farmland acreage from 2008 to 2050 (no activity in 2050)
Solid Waste Management	Methane emissions from landfilled waste	City SWMD (city-level data) CalRecycle (city-level data) EPA Landfill Methane Outreach Program (2009)(LMOP) database (statewide data) CARB Landfill Emissions Report	None	Population growth forecasts

Sector	Emission Sources	Source of Data	Scaling Methods	Projection Methods
		(statewide data)		
Wastewater Treatment and Discharge	CH_4 and N_2O emissions from the treatment of wastewater from domestic sources (municipal sewage)	Inland Empire Utilities Agency (county-level data) CARB California GHG inventory	Population	Related to population growth forecasts[e]
Water Transport, Distribution, and Treatment	Indirect electricity emissions for water supply and irrigation infrastructure	California Energy Commission Urban Water Management Plans (UWMP) (city-level data)	None	UWMP forecasts
SF_6 from electricity consumption	Fugitive emissions of SF_6 from the transport of electricity to the city	Electricity records from utilities (city-level data)[b] California Energy Commission, Urban Water Management Plan (city-level data)	None	Varies based on source of electricity CARB emission factors

[a] No scaling factor was used for cement plants.

[b] Electric utilities include SCE, Bear Valley Electric Services (BVES), Colton Public Utilities (CPU), Needles Public Utility Authority (Needles PUA), and Victorville Municipal Utility Services (VMUS).

[c] Natural Gas utilities include Southern California Gas Company (SCG), Southwest Gas (SWG), and VMU.

[d] Specific growth forecasts are based on individual emissions sources within these sectors (i.e., for off-road, residential equipment emissions were projected based on population, while industrial equipment emissions were based on non-retail employment).

[e] Solid waste emissions are based on past waste generated by each city, so the 2020 forecast accounts for past population growth in each city. See Appendix A for more detail.

Table 5-3. San Bernardino Population, Housing, and Employment Estimates and Forecasts

	Population			Households[a]			Employment		
City	2008	2020	Growth Factor[b]	2008	2020	Growth Factor[b]	2008	2020	Growth Factor[b]
Adelanto	31,200	46,084	1.48	7,670	11,900	1.55	5,432	7,313	1.35
Big Bear Lake	5,019	5,619	1.12	2,196	2,400	1.09	6,212	6,423	1.03
Chino	75,596	88,772	1.17	20,135	24,569	1.22	48,495	53,470	1.10
Chino Hills	74,571	76,558	1.03	22,870	23,999	1.05	9,302	10,452	1.12
Colton	52,103	60,652	1.16	14,955	17,842	1.19	24,023	25,529	1.06
Fontana	193,913	222,717	1.15	48,573	57,482	1.18	47,622	53,652	1.13
Grand Terrace	11,768	11,644	0.99	4,303	4,554	1.06	3,019	3,160	1.05
Hesperia	89,617	98,163	1.10	26,266	28,892	1.10	15,537	20,438	1.32
Highland	52,986	58,646	1.11	15,436	17,713	1.15	6,037	7,757	1.28
Loma Linda	23,027	26,746	1.16	8,675	10,459	1.21	17,597	23,281	1.32
Montclair	35,987	39,667	1.10	9,346	10,446	1.12	16,527	17,049	1.03
Needles	4,844	4,941	1.02	1,918	1,956	1.02	3,323	3,145	0.95
Ontario	162,871	215,765	1.32	44,639	61,128	1.37	114,339	151,279	1.32
Rancho Cucamonga	162,792	167,118	1.03	53,564	56,303	1.05	62,462	63,869	1.02
Redlands	68,576	75,494	1.10	24,701	28,262	1.14	41,435	46,682	1.13
Rialto	98,923	109,970	1.11	25,137	29,396	1.17	22,877	26,425	1.16
San Bernardino	209,924	231,151	1.10	59,310	66,924	1.13	101,253	113,357	1.12
Twentynine Palms	24,905	29,538	1.19	8,048	9,623	1.20	3,211	3,625	1.13
Victorville	111,872	145,345	1.30	31,423	43,687	1.39	33,705	45,930	1.36
Yucaipa	51,217	55,821	1.09	18,176	20,692	1.14	9,761	10,923	1.12
Yucca Valley	20,652	22,953	1.11	8,254	9,856	1.19	4,575	5,071	1.11
Total	1,562,363	1,793,364	N/A	455,595	538,083	N/A	596,744	698,830	N/A

[a] Includes single family and multifamily dwelling units.

[b] Represents the total growth between the forecast year and the existing year. For example, between 2008 and 2020, population in Adelanto is anticipated to increase by a factor of 1.48.

Sources: Forecast data provided by SCAG 2012a, and developed for the 2012 Regional Transportation Plan.

5.6 Inventory Limitations and Recommendations

This inventory identifies GHG emissions from regional activities in the 21-city region and serves as a baseline for emission reduction measures and as a starting point for future GHG emissions inventories. Future updates to the GHG emissions inventories presented in this report should be conducted annually to ensure that the inventory remains accurate and that data gaps are resolved in a timely manner. Annual updating also would enable efficient tracking of the effectiveness of any GHG reduction measures put in place to address these emission sources.

5.6.1 Emissions Sinks

Based on guidance provided by CARB, GHG emissions sinks[2] were not included in this report. Because these existing urban and natural forests are part of global atmospheric carbon cycling, ICLEI's Community Inventory Protocol (2012) recommends that this emissions sink be disclosed but not combined with other anthropogenic emissions in an emissions inventory. As such, carbon stocks and GHG emissions sinks were not included in the community inventories for each city. As methodologies are developed for this area, it may benefit individual jurisdictions to add emission sinks to the inventories where sinks or changes in sinks represent a meaningful part of the local inventory. Given the local setting, the 21-city region likely has relatively limited emissions sinks due to the relative lack of large forested areas or wetland areas within city limits. The most substantial carbon sinks in the county are likely the national forest areas that are under federal jurisdiction.

5.6.2 Activity Data

Although considerable efforts were made to obtain activity data from 2008, in some cases these data were unavailable and data from another year were substituted (i.e., year 2007 stationary source data and natural gas combustion data for some cities in the commercial/industrial sector). In addition, data obtained for certain sectors were provided in an aggregated format. For example, building energy use data provided by the major utilities supplying electricity and natural gas to the cities were aggregated by general sector (i.e., residential or commercial plus industrial) instead of by specific activity or entity. In addition, natural gas consumption data for some cities were estimated because the 15/15[3] rule does not permit the utilities to disclose natural gas consumption for these cities. A greater level of detail and disaggregation would strengthen this inventory and greatly increase the potential for the cities and the Partnership to identify, quantify, and monitor effective emission reduction actions. Specific data gaps and limitations are identified and discussed on a sector-by-sector basis below.

[2] A GHG emissions sink is a natural or human-made reservoir that absorbs and stores more CO_2 or other GHG from the atmosphere than it releases.

[3] The 15/15 Rule was adopted by the California Public Utilities Commission (CPUC) in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality. The 15/15 rule requires that any aggregated information provided by the utilities must be made up of at least 15 customers and a single customer's load must be less than 15% of an assigned category. If the number of customers in the complied data is below 15, or if a single customer's load is more than 15% of the total data, categories must be combined before the information is released. The rule further requires that if the 15/15 Rule is triggered for a second time after the data have been screened once already using the 15/15 Rule, the customer be dropped from the information provided. In addition to the 15/15 Rule, the CPUC further determined that no information about customers with demands above 500 kW should be included in the distributed information.

5.6.3 High Global Warming Potential Gases

Emissions from the use of substitutes for ozone-depleting substances (ODS) (primarily hydrofluorocarbons [HFCs], and perfluorocarbons [PFCs])[4] were not included in the inventories. These substances are high GWP gases but are not specifically recommended for quantification in regional inventories. Quantification of these emissions is based on statewide emissions factors regarding a suite of possible sources, and thus scaling those emissions to the regional or local scale likely introduces considerable uncertainty. In addition, the cities have limited or nonexistent jurisdiction or influence over these emissions.

5.6.4 On-Road Transportation

The VMT by speed bin data from SCAG was available at the county level and could not be made available at the city level. It would take significant data processing effort from SCAG to make city-level data available. Therefore, ICF used the proportion of the county's VMT in each speed bin to disaggregate each city's VMT by speed bin in order to apply the appropriate emission factors to calculate emissions. This method assumes that all cities have a VMT by speed distribution that is the same as the overall county. Although the impact on the inventory is not likely to be significant, if city-level VMT were available by speed bin, it would lead to a more accurate inventory.

5.6.5 2020 Business-as-Usual Forecasts

The 2020 BAU emissions forecasts are based largely on estimates, forecasts, and growth factors and not actual activity data for those years. BAU emissions for 2020 are projected based on the most appropriate growth data available for each sector. For example, 2020 energy use emissions are estimated based on projected population, employment, and housing growth. Where possible, 2020 BAU projections were made using the best available information and estimates provided by city staff and experts on individual sectors. For many sectors (e.g., residential fuel combustion), projections were based on the future population estimate for the city using data provided by SCAG. This method assumes that emissions will remain proportionate to the current population, which may not be completely accurate. For example, per capita energy consumption may change over time as habits and technology change. For some sectors, especially where emissions are tied to infrastructure (e.g., stationary sources, agriculture) rather than population, estimates were made based on an anticipated maximum or buildout of infrastructure. It is possible that the ratio of certain emissions sources (e.g., natural gas combustion in commercial buildings) to a quantity of infrastructure (e.g., commercial square feet) may also change over time.

[4] Emissions of HFCs and PFCs occur from their use in refrigeration and air conditioning systems. These high global warming potential (GWP) compounds were phased in as ODS substitutes. The majority of anthropogenic high GWP GHGs include SF_6, HFCs, and PFCs

Appendix D

State and County Reduction Measures

D1 State and County Reduction Measures

Measure	Description	Entity Responsible for Implementation:	Measure Implementation Details	Co-Benefits
State Measures				
State-1: Senate Bill 1078 (2002)/Senate Bill 107 (2006) and Senate Bill 2 (2011) Renewable Portfolio Standard	Obligates IOUs, ESPs, and CCAs to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010 and sets forth a longer-range target of procuring 33% of retail sales by 2020.	IOUs, ESPs, and CCAs are responsible for implementing this measure.	The responsible entities will procure incremental amounts of retail sales each year from renewable sources. By 2020, 33% of retail sales will be procured from renewable sources.	Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, and public health improvements.
State-2: Title 24 Standards for Non-Residential and Residential Buildings (Energy Efficiency Standards and CALGreen)	Requires that building shells and building components be designed to conserve energy and water. Mandatory and voluntary measures became effective on January 1, 2011, and the guidelines will be periodically updated. Local governments are responsible for adoption and enforcement of the standards. The next energy efficiency update of standards is in 2014 and the CEC intends to update them approximately every 3 years in future years. Note: In some instances, implementation of the CALGreen voluntary measures has been identified by local cities as part of their selected local measures.	Local governments are responsible for implementation and enforcement of the standards.	This measure would be implemented in the Partnership cities gradually as new homes are built.	Reduced energy use, reduced air pollution, resource conservation, increased property value, public health improvements, and increased quality of life.
State-3: AB 1109 (Huffman) Lighting Efficiency and Toxics Reduction Act	Structured to reduce statewide electricity consumption in the following ways: 1) At least 50% reduction from 2007 levels for indoor residential lighting, and 2) At least 25% reduction from 2007 levels for indoor commercial and outdoor lighting, by 2018.	The State of California is responsible for implementing this measure.	By 2018, reductions of 50% and 25%, compared to 2007 levels would be achieved.	Reduced energy use, reduced air pollution, increased property values, and increased quality of life.

Measure	Description	Entity Responsible for Implementation:	Measure Implementation Details	Co-Benefits
State-4: AB 1470 (Huffman) Solar Water Heating	Creates a $25 million per year, 10-year incentive program to encourage the installation of solar water heating systems that offset natural gas use in homes and businesses throughout the state.	The State of California is responsible for implementing this measure.	This measure would be implemented gradually as residents replace their heaters with solar water heating systems.	Reduced energy use, reduced air pollution, increased property values.
State-5: Industrial Boiler Efficiency	This measure evaluated by CARB would require one or more of the following: annual tuning of all boilers, the installation of an oxygen trim system, and/or a noncondensing economizer to maximize boiler efficiency. A facility could also replace an existing boiler with a new one that is equipped with these systems.	State of California is responsible for implementing this measure.	This measure would be implemented gradually as industrial facilities replace their boilers.	Reduced energy use and reduced air pollution.
State-6a: AB 1493 (Pavley I and II) Greenhouse Reductions from New Passenger Vehicles	AB 1493, (Pavley I) requires CARB to adopt vehicle standards that will lower GHG emissions from new light-duty autos in 2009. Additional strengthening of the Pavley standards (Pavley II or Advanced Clean Cars measure) has been proposed for vehicle model years 2017–2025. Together, the two standards are expected to increase average fuel economy to roughly 43 miles per gallon by 2020 and reduce GHG emissions from the transportation sector in California by approximately 14%.	The State of California, EPA and NHTSA, and vehicle manufacturers are responsible for implementing the Pavley standards.	The 2011—2016 standards would be implemented through 2016 and the 2017—2025 standards would be implemented through 2020. Implementation in the Partnership cities would be gradual through 2016 and 2020 as older vehicles are replaced with more fuel efficient vehicles.	Reduced energy use, reduced air pollution, public health improvements, and energy security.
State-6b: (On-Road) and State-8 (Off-Road): Executive Order S-1-07 Low Carbon Fuel Standard	Mandates the following: (1) that a statewide goal will be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that a LCFS for transportation fuels be established in California.	The State of California and vehicle fuel manufacturers are responsible for implementing this measure.	The standard would be fully implemented by 2020. Implementation in the Partnership cities would occur as fuel is improved statewide.	Reduced air pollution, public health improvements, energy security, reduced price volatility, and economic development.

Measure	Description	Entity Responsible for Implementation:	Measure Implementation Details	Co-Benefits
State-7: Assembly Bill 32 (AB 32) Transportation Reduction Strategies	The AB 32 Scoping Plan includes vehicle efficiency measures (in addition to Pavley and LCFS) that focus on maintenance practices. The following AB 32 reduction strategies and/or programs are included: • Tire Pressure Program (assures vehicle tire pressure is maintained to manufacturer specifications). • Low Rolling Resistance Tires (creates an energy efficiency standard for automobile tires to reduce rolling resistance). • Low Friction Engine Oils (mandates the use of engine oils that meet certain low friction specifications). • Cool Paints and Reflective Glazing (reduces the engine load for cooling the passenger compartment with air conditioning through the use of solar reflective paints and window glazing). • Goods Movement Efficiency (targets system-wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion). • Heavy Duty Vehicle GHG Emission Reduction (requires installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance). • Medium and Heavy-Duty Vehicle Hybridization (adopts a regulation and/or incentive program that reduces the GHG emissions of new vehicles sold in California by replacing them with hybrids).	The State of California is responsible for implementing this measure.	Implementation in the Partnership cities would occur gradually through 2020 as the statewide strategies and programs are put into effect.	Reduced energy use, reduced air pollution, public health improvements, and energy security.

Measure	Description	Entity Responsible for Implementation:	Measure Implementation Details	Co-Benefits
State-9: AB 32 Methane Capture	The Landfill Methane Rule requires gas collection and control systems on landfills with greater than 450,000 tons of waste-in-place. The measure also establishes statewide performance standards to maximize methane capture efficiencies.	Landfill owners and operators are responsible for complying with the landfill regulation.	This measure would be implemented gradually by 2020 as landfill operators comply.	Reduced air pollution, resource conservation, and increased quality of life.
County Measures				
County-1: San Bernardino County GHG Reduction Plan Landfill Controls	San Bernardino County, through the adopted Reduction Plan, would install landfill gas controls on the following County-owned and operated landfills. 95% capture at Mid-Valley landfill 85% capture at Milliken and Colton landfills 75% capture at Barstow and Landers landfills Since these landfills serve several of the cities of San Bernardino County, these cities would realize GHG reductions from the County's installation of landfill gas controls.	The County of San Bernardino is responsible for implementing this measure.	San Bernardino County would need to upgrade and install equipment as necessary to increase and utilize the captured methane gas. The installation of equipment is a one-time event, and implementation would be complete once the equipment begins operating.	Reduced energy use and reduced air pollution.

Appendix E

Potential Funding Sources to Support GHG Reduction Measures

E1 Potential Funding Sources to Support GHG Reduction Measures

Fund	Fund Description
State and Federal Funds	
Federal Tax Credits for Energy Efficiency	• Tax credits for energy efficiency can be promoted to residents. • Tax credits available in 2012 include geothermal heat pumps, small (residential) wind turbines, solar energy systems, and fuel cells. • The tax credit is for 30% of cost with no upper limit for geothermal heat pumps, wind turbines, and solar energy systems. • For fuel cells, the tax credit is for 30% of cost up to $500 per 0.5 kW of power capacity in a principal residence.
Energy Efficient Mortgages (EEM)	• An EEM is a mortgage that credits a home's energy efficiency in the mortgage itself. • Residents can finance energy saving measures as part of a single mortgage. • To verify a home's energy efficiency, an EEM typically requires a home energy rating of the house by a home energy rater before financing is approved. • EEMs are typically used to purchase a new home that is already energy efficient, such as an ENERGY STAR® qualified home.
California Department of Resources Recycling and Recovery (CalRecycle)	• CalRecycle grant programs allow jurisdictions to assist public and private entities in management of waste streams. • Incorporated cities and counties in California are eligible for funds. • Program funds are intended to: - Reduce, reuse, and recycle all waste. - Encourage development of recycled-content products and markets. - Protect public health and safety and foster environmental sustainability.
California Air Resources Board (CARB)	• CARB offers several grants, incentives, and credits programs to reduce on-road and off-road transportation emissions. Residents, businesses, and fleet operators can receive funds or incentives depending on the program. • The following programs can be utilized to fund local measures: - Air Quality Improvement Program (AB 118) - Carl Moyer Program – Voucher Incentive Program - Goods Movement Emission Reduction Program (Prop 1B Incentives) - Loan Incentives Program - Lower-Emission School Bus Program/School Bus Retrofit and - Replacement Account (Prop 1B and EPA Incentives)
Existing Capital Improvement Program	• State and federal funds would most likely continue to local governments, builders, and homeowners in the following forms. - Grants - Transportation and transit funding - Tax credit and rebate programs • The Capital Improvement Program can be utilized for measures relating to traffic or transit.

Fund	Fund Description
State Funding for Infrastructure	• The state's Infill Infrastructure Grant Program may potentially be used to help fund measures that promote infill housing development. • Grants can be used for gap funding for infrastructure improvements necessary for specific residential or mixed-use infill development projects.
Transportation-Related Federal and State Funding	• For funding measures related to transit, bicycle, or pedestrian improvements, the following funding sources may be utilized. - Safe, Accountable, Flexible, Efficient Transportation Equity Act—Legacy for Users (SAFETEA-LU). - FTA Small Starts - Surface Transportation Program Fund, Section 1108 (STP) - FTA Section 5311(f) - Congestion Mitigation and Air Quality Improvement Program, Section 1110 (CMAQ) - California's Bicycle Transportation Account (BTA) - Transportation Enhancement Activities (TEA) - Environmental Enhancement and Mitigation (EEM) Program - National Recreational Trails Program Safe Routes to School (SR2S) - National Highway System Fund (NHS) Office of Traffic Safety (OTS) - National Highway Safety Act, Section 402 - Transportation Development Act (TDA) Article III - Transit Enhancement Activity, Section 3003 - Transportation Funds for Clean Air (TFCA, formerly AB 434) - Section 3 Mass Transit Capital Grants Flexible Congestion Relief (FCR) Program - Bridge Repair & Replacement Program (BRRP) - State Highway Operations and Protection Program (SHOPP) - Federal Transit Administration (FTA) 5309
City-Level Funding	
Public Utility Enterprises	• Cities that operate water and sewer public utilities can utilize increased rates to fund capital improvements associated with water or wastewater measures
Other Local/Regional Funding Sources	• SCAQMD has several grant programs related to air quality improvement, some of which may apply to various reduction measures. • Bus Stop Sponsorships—Advertisement sponsorship of bus stops has been utilized as a revenue source. • Transit Fare Increases—Transit fares could be increased to help fund capital improvements, though increases also have the potential to decrease ridership in the short term. • Parcel Tax—An election consistent with Proposition 218 could serve to increase the existing level of taxation and provide additional funding for transit-related capital improvements. However, in the current economic climate, this may not be a likely financing source unless economic conditions improve and community support for such a taxation approach is favorable.

Fund	Fund Description
Utility Rebates	
California Solar Initiative	• SoCal Edison is one of the three utilities participating in the Go Solar initiative. • A variety of rebates are available for existing and new homes. • Photovoltaics, thermal technologies, and solar hot water projects are eligible. • Single-family homes, commercial development, and affordable housing are eligible. • Budget for solar generation for 2007–2016: $2.2 billion. • Budget for new solar hot water systems for 2010–2017: $250 million.
Energy Upgrade California	• Program is intended for home energy upgrades. • Funded by the American Recovery and Reinvestment Act, California utility ratepayers and private contributions. • Utilities administer the program, offering homeowners the choice of one of two upgrade packages—basic or advanced. • Homeowners are connected to home energy professionals. • Rebates, incentives, and financing are available. • Homeowners can receive up to $4,000 back on an upgrade through the local utility.
Private Funding	• Private equity can be used to finance energy improvements, with returns realized as future cost savings. • Rent increases can fund retrofits in commercial buildings. • Net energy cost savings can fund retrofits in households. • Power Purchase Agreements (PPA) involve a private company that purchases, installs, and maintains a renewable energy technology through a contract that typically lasts 15 years. After 15 years, the company would uninstall the technology or sign a new contract. • Power produced from a PPA is sold to customers. SANBAG recently approved a contract for solar power site assessments, bringing together a number of cities and agencies to aggregate their solar sites. • On-Bill Financing (OBF) can be promoted to businesses for energy efficiency retrofits. Funding from OBF is a no-interest loan that is paid back through the monthly utility bill. Lighting, refrigeration, HVAC, and LED streetlights are all eligible projects.
Other Funding Mechanisms for Implementation	• Increased operating costs can be supported by grants from the Strategic Growth Council (SGC) or the State Department of Conservation (DOC) to fund sustainable community planning, natural resource conservation, and development, adoption, and implementation of Sustainable Community planning elements, including climate action plans and general plan amendments.
Future Funding Options: Funding Mechanisms for Capital and/or Implementation Costs	
New Development Impact Fees	• These types of fees may have some potential to provide funding, but such fees are best implemented when the real estate market and overall regional economic conditions are strong.
Utility User Tax Increase	• Increasing this tax could help fund ongoing implementation, operations, and maintenance efforts. Any increase of tax rates will need to be highly sensitive to current local economic conditions and overall local, state, and national economic and financial context.
Additional Local Sales Parcel Tax	• Increasing local sales or parcel taxes would require voter approval and could provide funding for measures related to transit improvements or retrofit programs. Any increase of tax rates will need to be highly sensitive to current local economic conditions and overall local, state, and national economic and financial context.
Community Facilities District (CFD) Special Taxes	• Creating this special tax would require voter approval and could be best directed towards measures with broad benefits for the community (e.g., transit, pedestrian and bicycle facilities, safe routes to schools). Any increase of tax rates will need to be highly sensitive to current local economic conditions and overall local, state, and national economic and financial context.

Fund	Fund Description
General Obligation Bond	• A general obligation bond is a form of long term borrowing and could be utilized to fund municipal improvements.
AB 811 Districts Property- Assessed Clean Energy (PACE)	• AB 811 is intended to help municipalities accomplish goals outlined in AB 32. • The PACE finance program is intended to finance energy and water improvements within a home or business through a land-secured loan, and funds are repaid through property assessments. • Municipalities are authorized to designate areas where property owners can enter into contractual assessments to receive long-term, low-interest loans for energy and water efficiency improvements, and renewable energy installation on their property. • Financing is repaid through property tax bills. • AB 811 and the PACE program are currently on hold for residential properties due to potential violation of standard FHFA federally guaranteed (Fannie Mae/Freddie Mac) residential mortgage contracts. • The PACE program is not on hold for commercial properties. • SANBAG intends to administer a PACE program in the region. • SANBAG will structure a regional energy efficiency and water conservation improvement loan program for existing buildings (AB 181 and AB 474).